

# SLAM 200 数据处理流程





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## 1.创建工程

#### 1.1 SLAM 200 原始数据

SLAM 200 采集的数据存储在设备 SD 卡中,采集的数据包会以"SN\_XXXX" 命名的文件夹方式储存。原始数据包含鱼眼镜头数据、实时建图成果、雷达数据、 光栅数据、imu 数据、大疆飞机状态信息文件、GPS 观测数据、RTK 观测数据、 数据详细信息、RTK 数据信息、相机标定文件、雷达标定文件。

→ CS → SLAM200数据 × SN_00063 →				~ (
名称	修改日期	类型	大小	
SLAM_PRJ_001	2025/2/6 1 <mark>5:4</mark> 2	文件夹		
· CS → SLAM200数据 → SN_00063 →	SLAM_PRJ_001 >			
名称	^			~
<ul> <li>COLOR_CAM 鱼眼镜头</li> <li>REAL_SLAM 实时建图成果</li> <li>20250107-112053_00126_SLAM_Pail</li> <li>20250107-112053_Ec_Data.fmrastel</li> <li>20250107-112053_Hp_Imu.fmimr</li> <li>20250107-112053_Rtk.dfnav 大</li> <li>20250107-112053_Rtk.fmcompb</li> <li>20250107-112053_Rtk.fmnav</li> <li>Description_File.txt</li> <li>oriented.txt</li> <li>pano_calib.yaml</li> <li>slam_calib.yaml</li> </ul>	ndar_0001_0.fmlida r 光栅数据 imu数据 置飞机状态信息了 GPS观测数据 RTK观测数据 数据详细信息 RTK数据信息 相机标定文件 雷达标定文件	r 雷达数据 文件		

图 SLAM 200 原始数据



#### 1.2 新建工程



点击【新建】,设置工程名称和工程路径,设备选择【SLAM 200】,平台选择【手持】,单击【下一步】,在输入路径选择原始数据所在文件夹,软件会自动 识别文件夹内数据,点击【完成】即可完成工程创建。





图 新建工程

数据采集同时采集控制点的情况,需要在新建工程后将控制点导入到工程内, 右键单击数据管理窗口的控制点数据功能,选择【添加数据】,将整理好的控制 点文件导入软件中,软件支持设置本地坐标系及投影坐标系,但该设置并不影响 最终输出的点云坐标。





1.控制点文件里记录的顺序必须与扫描仪实际采集过程中的顺序和数量保持 一致,否则控制点会对应错误,导致解算出错。

2.控制点暂时不支持经纬度,现支持投影坐标或者空间直角坐标,控制点文件格式要求为.txt格式,内容为四列,依次为:ID,东坐标,北坐标,高程(间隔符为英文",")。

#### 1.2.2 背包模式

点击【新建】,设置工程名称和工程路径,设备选择【SLAM 200】,平台选择【Pack200】,单击【下一步】,在输入路径选择原始数据所在文件夹,软件会自动识别文件夹内数据,单击【下一步】设置成果坐标系,点击【完成】即可完成工程创建。





该模式适用于使用三脚架进行站式扫描的采集方式,具体操作如下:

点击【新建】,设置工程名称和工程路径,设备选择【SLAM 200】,平台选择【静态】,单击【下一步】,在输入路径选择原始数据所在文件夹,软件会自动 识别文件夹内数据,单击【下一步】设置成果坐标系,点击【完成】即可完成工程创建。

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ROBOTIO			www.feimarobotics.com
Slam Go Post Pro			- □ ×
▲ 一 ▲ ▲ ● ▲ ● ★ ★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★	2 200 200 前方式化 去開支 市方開色 全銀型		
数据管理窗口 8	Q Q 🖱 🕱 🗇 📦 🕂 📇 🗗 📩 🖬		
		SLAM GO POST Pro	
	日期: 2	025/2/12	
	· · · · · · · · · · · · · · · · · · ·	1.48200 -	
	平台: 1	₩a •	
	路径: [	E/	
	繼述:		
		下一步之	
	运行窗口		đ
	当前状态:		
	当前处理进度:	0%	
	总进度:	0/1	
	运行窗口		
FE P	DBO	图 新建工程	
		₩	

## 1.2.4 混合模式

该模式适用于一次采集数据内多次架站扫描的采集方式,具体操作如下:

点击【新建】,设置工程名称和工程路径,设备选择【SLAM 200】,平台选择【混 合】,单击【下一步】,在输入路径选择原始数据所在文件夹,软件会自动识别文 件夹内数据,单击【下一步】设置成果坐标系,点击【完成】即可完成工程创建。



图 新建工程



#### 1.2.5 车载模式

点击【新建】,设置工程名称和工程路径,设备选择【SLAM 200】,平台选择【车载】,单击【下一步】,在输入路径选择原始数据所在文件夹,软件会自动 识别文件夹内数据,单击【下一步】设置成果坐标系,点击【完成】即可完成工程创建。

Slam Go Post Pro 开始 视图 工具				- 🗆 ×
🕥 📼 🖬 🛛	🖻 🖻 🎘 🖉 🛞 🔳 🎄	🖻 🔅 🎇 🎝 🗖	-R' 📧 🖪 🎄 🖏	
新建打开保存关闭	一罐处理 找处理 点云建图 重定向 点云优化 去畸变 点云颜色	全暴圈生成 去除爆声 点云分幅 拼接转换 点云就切	RINEX格式转换 PPK解算 種度服告 坐标转换设置 导出Cyberg	20 取到此理
工程	-	数据处理		
<b>双语管理第</b> 二	- • • • • • • • • • • • • • • • • • • •	工程向导	×	
	<b>A</b>	SLAM GO POST Pro		
		hall a c		
		80%: 3180_Fraject		
		응율: SLAM200		
		平台: 车载	-	
		编径: D:/		
		<b>展</b> 过:	T-db	
	· · · · · · · · · · · · · · · · · · ·			
	当前状态:		line line line line line line line line	
	当前处理进度:		0%	
	<b>6)</b> 注意:		9/1	
	時行第日			
L				
📩 工程向导 🔛 SL	AM GO POST Pro	×	🙀 工程向导 🔛 SLAM GO PC	DST Pro
输入 98.47. D:/SN 0028	7/PR0T1		坐标类型: 地理坐标	*



图 新建工程





#### 2.1.1 一键处理

新建工程后,点击数据处理工具栏的【一键处理】,根据采集场景和成果要 求设置不同参数,参数具体解释如下:

1) 建图类型

原始建图:该模式下建图输出原始点云数据成果,软件不进行点云优化处理, 后续步骤均基于原始点云进行;

建图优化: 该模式下建图后软件自动进行行人滤波、点云优化处理,处理后保留点数量为原始建图的 1/4;



2) 建图算法

快速模式:建图速度快,建图效果及精度稍差;

高精度模式:建图速度慢,建图效果及精度更高;

注: 1.采集控制点情况下软件默认跳过静止时间,不需要主动忽略数据段。

2.使用高精度模式解算数据,采集开始后必须在地面静止 60s。

3) 使用设备

目前只限于全景图拼接功能,若无支持通用计算的显卡,可手动切换到 CPU 模式;

4) 采集稳定度【1-5】

快速模式:标定后的设备如果是相对开阔区域场景,参数值设置最大的5,标定后的设备如果是楼梯等经常会旋转拐弯的场景,参数设置4或者3;

高精度模式:优先使用稳定度5进行解算;

目前算法为自动枚举模式,即先使用设置的稳定度进行点云建图,若解算提示点云飘飞,则软件自动使用下一级稳定度进行点云建图,以此类推,直到建图成功后继续执行后续步骤;如果直到稳定度1也建图失败,则程序停止处理,软件提示解算失败。

5) 忽略数据段

剔除静止的冗余数据/剔除质量较差的数据,标准采集模式无需设置忽略时间; 6)数据段时长

解算给定时长的数据,此参数与跳秒时间参数配合,可以解算任意时间段点 云数据;

7) 点云定向

刚体:基于控制点直接对解算后的点云做坐标转换;

非刚体: 基于控制点或 RTK 数据优化点云并定向;



8) 其他结果

全景图: 由单张影像拼接而成的全景图;

点云赋色: 由影像给点云数据着色;

若只勾选全景图和赋色点云选项,默认使用内置相机进行全景图和点云赋色, 若使用全景相机进行全景图和点云赋色,则需要勾选全景图和赋色点云选项,然 后点击赋色点云右侧的设置按钮 <sup>()</sup>,设置【源图像】【全景相机数据】和全景 照片路径。

输出未赋色点:默认设置处理会不输出赋色失败的点云,勾选该选项将没有 赋色的点云同时输出。

输出上采样点云:对赋色点云进行加密处理。

注: 点云赋色是单片赋色并不是全景图赋色, 因此和全景图无关。

9) 其他设置

首尾同点: 首尾约束设置, 形成闭环消除分层;

注: 首尾同点功能仅适用于弱纹理地形,且常规解算后分层的情况,并且外 业采集时必须保证闭环处有 5-10m 重复路线,且开始采集点与结束采集点之间 距离不超过1米,因此常规情况下,解算时不需要勾选首尾同点。

建图实时显示:实时显示点云建图过程。

行人滤波:滤除点云内动态行人,勾选此选项,在点云建图后进行行人滤波 处理。

导出赋色点云: 解算后导出赋色点云 las 文件。

隧道场景:隧道、矿道等弱纹理场景,常规快速和高精度建图失败的情况可 以使用隧道场景处理,推荐使用隧道场景+高精度模式处理。

稠密优化:点云优化后保留点数量为原始建图的90%。

Slam解算参数设置			
参数			
建图类型	○ 原始建图	○ 建图优化	
建图算法	○ 快速模式	◎ 高精度	
使用设备	○ 使用GPV	○ 使用CPU	
采集稳定度【1−5】	5		÷
忽略数据段	0.00		\$ 秒
数据段时长	0.00		€ 秒
点云定向	〇刚体	◎ 非刚体	
其他结果	□ 全景图	□ 赋色点云	0
其他设置	□ 首尾同点	☑ 建图实时显示	
	□ 行人滤波	□ 导出赋色点云	
	□ 隧道场景		
		确定	取消
	and the second se	AP.C	

## 2.1.2.1 加载点云

右键点击待查看点云,选择【添加至视图】,即可将点云添加至主视图中显 示浏览。



图 加载点云



#### 2.1.2.2 加载里程计数据

右键里程计文件,选择【添加至视图】,即可将里程计文件添加至主视图中 显示浏览,目前里程计文件仅支持和定向前点云套合查看。



#### 图 加载里程计数据

#### 2.1.2.3 加载 POS 数据

右键 POS 文件,选择【添加至视图】,即可将 POS 文件添加至主视图中显示 浏览,目前 POS 文件仅支持和定向前点云套合查看。



图 加载 POS 数据



#### 2.1.2.4 加载全景图

将 POS 数据加载至视图,点击【全景图】,点击对应的 POS 点即可浏览该点 位的全景图;若使用的设备为全景相机,则可以全景图与点云叠加查看,并可以 在全景图上测量距离。



图 加载全景图

### 2.1.3 数据导出

点云解算后将需要的点云成果导出成 las 格式,在对应的点云数据右键,点击【数据导出】,选择保存路径和保存名称,提示导出成功后,数据导出完成。







#### 2.2 分步解算

#### 2.2.1 点云建图

在点云建图前右键激活对应工程,当数据管理窗口中仅存在一个工程时,软件默认其为激活状态,即标蓝显示,此时无需单独激活处理。点击【点云建图】, 弹出 Slam 解算参数设置对话框,选择处理模式并设置参数,点击【确定】开始 解算,解算完成后点云数据中生成的点云为建图后的原始点云。

参数设置同 2.1 一键解算。

	A Pac	A Stand
教设置		>
○ 快速模式	○ 高精度	
○ 使用GPU	◯ 使用CPV	
-5] 1		•
0.00		€ 秒
0.00		€ 秒
□ 首尾同点	☑ 建图实时显示	
	确定	取消
	★ 数设置 ● 快速模式 ● 使用GPU 5】  1  0.00  0.00  0.00  1 首尾同点	<ul> <li>数设置</li> <li>● 快速模式 ○ 高精度</li> <li>● 使用GPV ● 使用CPV</li> <li>● 使用GPV</li> <li>● 使用CPU</li> <li>● 使用CP</li></ul>

图 点云建图



#### 2.2.2 重定向

点击数据处理工具栏中的【重定向】进行点云重定向处理,该步骤可将点云 相对坐标转到控制点所在的绝对坐标系中。在重定向对话框中选择要重定向的点 云数据,点击【确定】开始重定向,若控制点与匹配点数量不一致,进行控制点 编辑后再次运行【重定向】。重定向后点云数据中加载的以gcp开头的点云为定 向后的成果。

选择	文件
0	optimised_2022-10-21_12-17-19_184
	optimize_filter_gcp_optimised_2022-10-21_12-17-19_18
0	gcp_optimised_2022-10-21_12-17-19_184

图 重定向文件选择

注: 非刚性变换不支持选择点云

#### 2.2.3 点云优化

点击数据处理工具栏中的【点云优化】进行优化处理。选择需要优化的点云数据后,点击【确定】开始执行处理。处理后点云数据中加载的 optimize 开头的点云为优化后的成果数据。

O optimised 2022-08-02 21-37-18		
	O optimised_2022-08-02_21-37	-18_570
filter_optimised_2022-08-02_21-37-	filter_optimised_2022-08-02_21	-37-18_5

图 点云优化文件选择



#### 2.2.4 去畸变

点击数据处理工具栏中的【去畸变】开始相片去畸变处理。去畸变后的影像数据保存在 dimages 文件夹中。

运行窗口		
当前状态: 生成无畸变影像		
当前处理进度:		1%
总进度:		0/1
运行窗口 日志窗口		
	图 去畸变	

#### 2.2.5 点云赋色

点击数据处理工具栏中的【点云赋色】进行点云赋色处理。

在点云赋色对话框中勾选要进行赋色处理的点云文件,点击【确定】执行赋 色。赋色后点云数据中加载的以 texture 开头的点云为赋色后的成果。

	点云赋色		×
	选择	文件	
	0	optimised_2024-05-21_15-44-16_603	
	0	gcp_optimised_2024-05-21_15-44-16_603	
	源图像 <ul> <li>內置相机</li> <li>赋色输出设置</li> <li>輸出未就色点</li> </ul>	<ul> <li>輸出上采样点云</li> <li>満定 取消</li> </ul>	3
EINO DOBOT	Ē	图 点云赋色文件选择	

#### 2.3.6 全景图生成

点击数据处理工具栏中的【全景图生成】进行全景图生成处理。由无畸变影像拼接而成的全景图保存在 pano 文件夹中。

当前状态:	全景图生成	
当前处理进度:		1%
总进度:		0/1
运行窗口 日月	志室口	



图 全景图生成

#### 2.3 批处理

点击数据处理工具栏的【批处理】,弹出 Slam 解算参数设置对话框,选择解 算模式、解算参数和解算过程,点击【确定】开始解算。

診数设置同 2	.1一键解算。		
Slam解算	参数设置		
参数			
建图类型	○ 原始建图	○ 建图优化	
建图算法	○ 快速模式	○ 高精度	
使用设备	○ 使用GPU	○ 使用CPV	
采集稳定度【1-	5		÷
忽略数据段	0.00		• 秒
数据段时长	0.00		≑ 秒
点云定向	○ 刚体	○ 非刚体	
其他结果	□ 全景图	🗆 赋色点云	e
其他设置	□ 首尾同点	☑ 建图实时显示	
	□ 行人遽波	□ 导出赋色点云	
	□ 隧道场景	□ 稠密优化	
			角定 取消

图 批处理

- 注: 1.需将不同设备类型分开批处理。 2.需将不同参数的工程分开批处理。
- 3.点云编辑
- 3.1 去除噪声

点击数据处理工具栏中的【去除噪声】模块进行点云去除噪声处理。进行去除噪声处理之前需先进行点云建图。

点击【去除噪声】,选择需要去除噪声处理的点云。在参数中设置【邻域点数】和【标准差倍数】,点击【确定】开始去除噪声处理。

领域点数:邻域内所需的点个数,用于计算与每个点的距离平均值。 标准差倍数:与标准偏差相乘的因子。







## 3.2 点云分幅

单击【点云分幅】,选中需要分幅的点云数据,选择分幅方式(比例尺或固 定大小),自定义添加前缀、分幅比例尺、图幅尺寸、大小、外扩范围及起始坐 标等,点击【分幅】后数据进行分幅处理。

	数据						
	选择			文件			
			opti	mised_2022-08-03_1	6-54-42_862		
EN							
	分幅方式:	比例尺		▼ 前缀:			
205	分幅方式: 比例:	比例尺 1:2000		▼ 前缀:			
201	分幅方式: 比例: 图幅大小:	比例尺 1:2000 50*40		▼ 前缀: [ cm 外扩	0.00	•	▼ m

图 数据分幅



#### 3.3 拼接转换

点云拼接转换前需将基准点云和待配准点云添加到视图。点击【拼接转换】, 选择需要拼接转换的基准数据和配准数据,支持自定义数据颜色也可以选择渲染 方式,分别在两组数据选点,至少选择三组同名点,选点结束后,可以调整配准 参数(ICP),点击【转换】完成拼接。

注:

- ▶ 选点时需要按住 Ctrl;
- > 支持导入控制点文件、手动输入、删除、清空同名点信息;
- ▶ 转换前应保证同名点顺序对齐,中误差(RMS)满足要求;
- 格网大小:是为了进行采样的间隔,不宜过小一般要大于 RMS 值,可 以加快处理速度;
- ▶ 迭代次数: ICP 算法的迭代次数, 一般 20 即可;
- 距离阈值,是同名点之间的最大距离,如果搜索到的匹配点大于该阈值则不参与计算;
- 距离迭代距离:是前后两次计算的距离的差值,如果小于这个值,则退出 迭代;

基准数据:	optimised_2	022-07-21_12-07	-57_169		
ID	Х	Y	Z	ERROR	+
AO	36.790	-7.732	0.634	0.000	Û
A1	35.653	-7.764	0.644	0.000	ā
A2	34.387	-7.739	0.652	0.000	
RO	-0.219	-17.059	-1 228	0.017	Ť
RO	-0.219	-17.059	-1.228	0.017	Î
R1	0.106	-15.776	-1.181	0.031	
R2	0.358	-14.269	-1.255	0.015	-
配准参数	(				
格网大小	: 0.50	*	距离阈值: 2.0		• *

图 拼接与转换



#### 3.4 点云裁切

点击【点云裁切】,选择需要裁切的数据、输出方式、添加裁切范围(矢量 文件支持 shp、dxf、fmb、kml 格式)、外扩范围等;点击【裁切】,进行点云裁 切。

	🛓 数据裁1	מ	×
	选择	文件	
		optimised_2022-07-20_18-22-35_755	
EIMATIC	输出方式: 裁切范围: 裁切外扩:	● 文件有限: ○ 范围有限: scale_1_2000; 5.00 全米 裁切 取消	ICS
FOD		图 点云裁切	

# 4.其他功能

## 4.1 RINEX 格式转换

点击【RINEX 格式转换】,进行从 fmcompb 到 O 的格式转换,此步骤为 ppk 解算的预处理步骤。

RINEX格式转换	×	
原始现测文件		
RINEI文件		
	添加	
	26,00	2
	应用取消	
	RINEX18358498	RINEX指式结点          原始级规文件          RINEX文件          法加          法加          近用       取消

#### 图 RINEX 格式转换



## 4.2 PPK 解算

点击【PPK 解算】,输入流动站、基准站观察数据,指定数据输出路径,建议选择 slam200 原始数据文件夹内。解算完成后,会在指定输出路径下,生成\*.ppk 文件,详细 ppk 解算流程见 6.1 节。

	解算			×
	流动站			
	观测数据			
	基站			
	O Rinex头信息 ○ 自	动 〇 用户自定义		
	经度	(小勬度或度:分:秒格式)		
	纬度	(小教度或度:分:秒格式)		
	高度(m)			
	观测数据			
	导航文件 ○ 流动站 (	○ 基站		
	GNSS星座 🔽 GPS 🛃 1	BeiDou 🗌 GLONASS 🗌 Galileo		
	输出			
612	输出路径			
001		解算	则消	

图 PPK 解算

#### 4.3 精度报告

点击【精度报告】,可以查看该工程精度报告,包括工程概况、点云预览图,控制点定向包含相对精度表和绝对精度表,rtk定向包含点云精度热力图。

ROBOTICS





X

机器人股份有限公司 SLAM定向料	青度报告
兄: 工程名称:	20
设备名称:	SLAM 100
基准椭球:	
坐标系统;	本地坐标系
定向类型:	刚性定向
	20100









1900 T					
2	平均距离误差		0.067		
45	06->07:	55.277	10->11:	55.309	-0.032
44	05->07:	97.945	9->11:	98.040	-0.095
43	05->06:	68.665	9->10:	68,669	-0.00
42	x3->07:	162.923	8->11:	163.069	-0.14
41	x3->06:	139.005	8->10:	139.041	-0.03
40	x3->05:	70.410	8->9:	70.443	-0.03
39	x2->07:	208.048	7->11:	208.199	-0.15
38	x2->06:	197.925	7->10:	197.971	-0.046
37	x2->05:	131.224	7->9:	131.265	-0.041

#### 控制点精度:

FEIMATICS

	控制点	(米)		3	量坐标(米)			残差	(m)	
控制点名称	东坐标X	北坐标Y	天坐标Z	测量坐标x	測量坐标y	测量坐标z	DX	DY	DXY	DZ
01	537684.885	4329166.220	-4.799	537684.815	4329166.191	-4.814	0.070	0.029	0.076	0.015
02	537714.693	4329160.084	-4.796	537714.630	4329160.053	-4.792	0.063	0.031	0.070	-0.004
03	537760.298	4329152.687	-4.811	537760.286	4329152.648	-4.815	0.013	0.040	0.042	0.004
04	537770.143	4329205.280	-4.795	537770.218	4329205.234	-4.906	-0.075	0.046	0.088	0.111
xl	537807.779	4329168.377	-4.833	537807.797	4329168.403	-4.818	-0.018	-0.026	0.032	-0.015
x2	537868.588	4329170.725	-4.834	537868.651	4329170.745	-4.821	-0.063	-0.020	0.066	-0.013
хЗ	537817.877	4329218.717	-4.845	537817.928	4329218.773	-4.797	-0.051	-0.056	0.076	-0.048
05	537747.516	4329221.334	-4.775	537747.532	4329221.351	-4.779	-0.016	-0.017	0.024	0.003
06	537679.197	4329228.217	-4.848	537679.209	4329228.228	-4.822	-0.012	-0.011	0.016	-0.026
07	537660.611	4329176.158	-4.790	537660.522	4329176.172	-4.762	0.089	-0.014	0.090	-0.028
			均值误差				0.000	-0.000	0.058	0.000
			RM SE				0.055	0.032	0.063	0.041

图 控制点定向精度报告

FEIMATICS







图 rtk 定向点云精度热力图

## 4.4 坐标转换设置

点击【坐标转换设置】,需在一键处理(包含重定向)或单步重定向之前完成相 关设置,处理后定向点云与轨迹即为转换后成果



### 4.5 导出 Cybergeo

点击【导出 Cybergeo】,导出赋色点云、全景图、轨迹文件,用于导入绘见软件 浏览。注:工程需包含赋色点云和全景图文件。

- 1	导出Cybergeo	×	
	☑ D:/CXO/SLAM语训赃相关软件及数据/O1 slam go post 软件详解/手持/prj/c	os	
	保存路径:		
	· 福宁 · 西·当		
7/3	490,XE 43X/F1		
202	图 导出 Cybergeo		

# 5.成果目录

新建工程完成后会在工程名称文件夹下生成如下的文件夹,用来保存各个处 理模块生成的成果文件。



clip	2024/12/18 9:50	文件夹
denoise	2024/12/18 9:50	文件夹
dimages	2024/12/18 9:50	文件夹
📙 filter	2024/12/18 9:50	文件夹
🔄 frames	2024/12/18 15:20	文件夹
gcp	2025/2/10 19:30	文件夹
📙 log	2025/2/10 17:01	文件夹
odometer	2024/12/18 15:00	文件夹
optimizer	2024/12/18 14:59	文件夹
pano	2024/12/18 9:50	文件夹
pos	2024/12/18 11:11	文件夹
- register	2024/12/18 9:50	文件夹
subdiv	2024/12/18 9:50	文件夹
📙 temp	2025/2/10 17:01	文件夹
texture	2024/12/18 18:00	文件夹
transform	2025/2/10 16:45	文件夹
Slam_Project.sprj	2025/2/11 9:08	SPRJ 文件

图 成果目录

#### 文件夹功能说明:

- ▶ clip: 保存裁剪后的点云数据;
- ▶ denoise:保存去除噪声后的点云数据;
- ▶ dimages: 保存去畸变后的影像数据;
- ▶ filter: 保存行人滤波后的点云数据;
- ▶ frames: 视频数据截帧后影像数据;
- ▶ gcp: 保存绝对定向里程计和点云;
- ▶ log: 保存处理日志;



- ▶ optimizer:保存优化后的点云;
- ▶ pano:保存由无畸变影像拼接而成的全景图和全景图 POS 数据;
- pos: 影像 POS 保存文件夹,其中 camera\_pos.txt 为影像 POS 文件、 camera\_trajectory.txt 为相机轨迹文件、lidar\_trajectory.txt 激光雷达轨迹 文件;



➤ register: 保存拼接点云;

➤ sudiv:保存分幅点云;

- ▶ temp: 工程临时文件夹, 包含工程信息和建图原始点云数据、log 日志;
- ▶ texture:保存赋色后点云;
- ▶ transform: 坐标转换配置文件;
- ➤ TEST.sprj: 工程文件。

## 6.常见问题

#### 6.1 PPK 解算流程

1.原始数据

1) 流动站 GPS 观测数据:存储在 SRTK 内存卡中,存储路径为 Raw 文件夹内的 fmcompb 文件。

AATIC 30TIC

	( UNIVER		1711	
此电脑 → Lidar (D:) → 20231222-SLAM200	0 > D081SN_00174	> srtk100	Raw	
~ 名称	修改日期	类型		大小
2023-11-6-6-37-2_63.fmcompb	2024/1/2 9:42	FMCOMPE	3 文件	18,136 KB

图 fmcompb 文件存储路径

2) 基准站 Renix 文件:实体基站或千寻网络基站。

(1)针对\*.GNS、\*.compb、\*.fmcompb格式的飞马标配基站数据,可以采用智理图GNSS处理模块中的【GNSS格式转换】工具转换为RINEX格式。

(2)如果基站不是飞马标配基站,可由基站厂家所提供的 RINEX 转换工具转换基站数据,将原始静态数据转换成标准\*.O 以及\*.N(或\*.P)格式, RINEX 版本为 3.02。

(3)使用网络基站可以通过智理图 GNSS 处理模块中的【GNSS 解算】导入流动站数据后,下载对应\*.O 以及\*.P 格式的基站数据,



名称 ^	修改日期	类型	大小	
raw-fm_252-1.23C	2024/7/17 18:10	23C 文件	45 KB	
raw-fm_252-1.23G	2024/7/17 18:10	23G 文件	18 KB	
raw-fm_252-1.23H	2024/7/17 18:10	23H 文件	1 KB	
raw-fm_252-1.23J	2024/7/17 18:10	23J 文件	1 KB	
raw-fm_252-1.23L	2024/7/17 18:10	23L 文件	1 KB	
raw-fm_252-1.23N	2024/7/17 18:10	23N 文件	33 KB	
raw-fm_252-1.23O	2024/7/17 18:13	230 文件	45,638 KB	

#### 图 实体基站 renix 文件

N > SLAM100PPK >	base > 2024-8-1-8-38-51_1	-vrs	~ Ū	在 2024-8-1
名称	修改日期	类型	大小	N
2024-8-1-8-38-51_1_base.o	2024/8/14 10:09	0 文件	3	8,900 KB
2024-8-1-8-38-51_1_base.p	2024/8/14 10:09	P 文件	4	449 KB
RENIX 格式转换	图 千寻基站 renix 文		CS	
RENIX 格式转换	图 千寻基站 renix 文	C件 MACT	C5	
RENIX格式转换	图 千寻基站 renix 文	C件 BOT	105	
RENIX格式转换 set Pro ﷺ I I I I I I I I I I I I I I I I I I I	图 千寻基站 renix 文		C9	<del>۲</del> ک

图 RENIX 格式转换

原始观测文件:选择待转换流动站的流动站 GPS 观测数据。

RINEX 文件:软件默认转换路径为原始 GPS 观测文件同级目录下。



图 RENIX 格式转换界面

转换后在同一目录下生成对应的流动站 renix 文件。



	2024/1/2 10:04	23C 文件	33 KB
1110-	2024/1/2 10:04	23G 文件	4 KB
转换后	2024/1/2 10:04	23N 文件	16 KB
	2024/1/2 10:04	230 文件	28,146 KB
	2024/1/2 10:04	23P 文件	88 KB
mpb	2024/1/2 9:42	FMCOMPB 文件	18,136 KB
	转换后 mpb	2024/1/2 10:04 2024/1/2 10:04 2024/1/2 10:04 2024/1/2 10:04 2024/1/2 10:04 2024/1/2 10:04 2024/1/2 10:04	转換后         2024/1/2 10:04         23C 文件           2024/1/2 10:04         23G 文件           2024/1/2 10:04         23G 文件           2024/1/2 10:04         23N 文件           2024/1/2 10:04         23O 文件           2024/1/2 10:04         23O 文件           2024/1/2 10:04         23P 文件           2024/1/2 9:42         FMCOMPB 文件

图 流动站数据转换

3. PPK 解算

Slam (	Go Post	l Pro																		
3	开始	视图																		
1			×		Ð		E.	1000 v		-	<b>**</b>		*	~3	1	•R*	Z		6	
新建	打开	保存	关闭	一键处理	批处理	点云建图	重定向	点云优化	去畸变	点云赋色	全景图生成	去除噪声	点云分幅	拼接转换	点云裁切	RINEX格式转换	e PPK解算	精度报告	取消处理	
	I	程										数据处理						P		
					2	Ċ	5			s PF	<b>PK</b> 解	算		P	. C	9				
	输	入活	动	站、	基		观察	这数:	据.	指	定数	居输	出路	径,	建	议选择	slar	n200	) 原女	台

制入机动站、墨油站观察数据,指定数据制出路径,建议选择 Stall200 原始数据文件夹内。

注: 使用千寻基站、飞马标配基站不需要输入基站点坐标,使用其他厂家基 站需要选择用户自定义,输入准确的基站点坐标。

流动站			
观测数据	C:/Users/fm53/Deskt	op/srtk100/Raw/2023-11-6-6-37-2_63.230	
基站			
🗿 Riner	朱信息 〇 自动 〇 用户	自定义	
经度	113.99996881	(小数度或度:分:秒格式)	
纬度	22.59738740	(小ু數度或度:分: 砂榕式)	
高度(m)	50.6002		
观测数据	C:/Users/fm53/Deskto	p/srtk100/Rav/base/2023-11-6-6-37-2_63-vrs/2023-11-6-6-37-2_63_base.o	
观测数据 导航文件 输出 输出路径	C:/Users/fm53/Deskto • 流动站 ○ 基站 C:/Users/fm53/Deskt	p/srth100/Rav/base/2023-11-6-6-37-2_63-vrs/2023-11-6-6-37-2_63_base.o 建议选择原始数据文件夹	
观测数据 导航文件 输出 输出路径	C:/Users/fm53/Deskto の 流动站 (基础 C:/Users/fm53/Deskto の の の の の の の の の の し の の し の し の し の し の し の の し の の し の の し の の し の の し の の の の し の の し の の し の の し の の の し の の し の の の の の の の の し の の の の の の の の の の の の の	p/srth100/faw/base/2023-11-6-6-37-2_63-vrs/2023-11-6-6-37-2_63_base.o 建议选择原始数据文件夹 cop/SLML_PAT_001	

解算完成后,会在指定输出路径下,生成\*.ppk 文件,如果差分解算没有输出到 slam100 原始数据路径下,需要把\*.ppk 文件拷贝至 slam100 原始数据路径下。

注: 使用 PPK 模式解算时,需要确保原始数据文件夹下无\*.fmnav 文件。



|--|

COLOR_CAM	2024/1/2 9:57	文件夹	
OPTICAL_CAM	2024/1/2 9:59	文件夹	
2023-11-6-6-37-2_63_all.ppk	2024/1/2 10:28	PPK 文件	629 KB
20231106-063803_Ec_Data.fmraster	2024/1/2 9:42	FMRASTER 文件	42,730 KB
20231106-063803_Hp_Imu.fmimr	2024/1/2 9:42	FMIMR 文件	103,640 KB
20231106-063803_Lidar_Data.fmlidar	2024/1/2 9:59	FMLIDAR 文件	3,121,956
20231106-063803_Lidar_Imu.imu	2024/1/2 9:42	IMU 文件	15,829 KB
20231106-063803_Lp_Imu.fmimr	2024/1/2 9:42	FMIMR 文件	43,817 KB
20231106-063803_Mark_Point.fmmark	2024/1/2 9:42	FMMARK 文件	1 KB
📄 slam_calib.yaml	2024/1/2 9:42	YAML 文件	1,327 KB

图 PPK 解算成果

#### 6.2 控制点提取

连接手机 APP 为主动式提取控制点,采集时使用控制点模式,采集结束后在 原始数据文件夹内会生成控制点标记文件 gcp.txt, 数据解算时根据控制点标记文 件进行控制点提取。

未连接手机 APP 为被动式采集,采集时静置 10s,数据解算时根据静止时间 的位置提取控制点。基于被动式提取模式,在外业采集过程中,需保证静止点距 离第一个控制点在 5-10 米以上。

#### 6.3 解算提示数据飘飞解算失败



图 建图飘飞提示 🧄

点云建图过程中跑飘,可以降低稳定度重新解算,或者打开成果文件夹中的 temp 文件夹里的 log 文件,最下面一行提示"Exit: pose has drifted!!!"表示数据跑 飘, 找到上面"Log I cpu 126.301 data 165.961 stamp 105318.998 position x -72.477829 y -33.911373 z -77.621452"的最后一行,其中 data 后的数值为数据跑 飘的时间。

数据可以通过分段解算,先使用数据段时长功能解算前半段数据,然后使用 忽略数据段时长功能解算后半段数据,由于后半段数据不包含开始地面静止 60s



的数据,所以只能用快速模式解算。

Log I cpu 118.140 data 151.394 stamp 105304.432 position x -87.740730 y -39.673676 z -112.043266
Log I cpu 118.669 data 152.410 stamp 105305.448 position x -86.214546 y -38.958515 z -108.176659
Log I cpu 119.277 data 153.497 stamp 105306.535 position x -84.465393 y -38.806610 z -104.215324
Log I cpu 119.832 data 154.535 stamp 105307.572 position x -82.786919 y -38.745983 z -100.261833
Log I +++++++++++++++++++++++++++++++++++
Log I cpu 120.479 data 155.636 stamp 105308.673 position x -81.144707 y -38.996563 z -96.803802
Log I +++++++++++++++++++++++++++++++++++
Log I cpu 121.073 data 156.647 stamp 105309.684 position x -79.814575 y -40.111832 z -93.908310
Log I +++++++++++++++++++++++++++++++++++
Log I cpu 121.634 data 157.653 stamp 105310.690 position x -78.823830 y -41.100086 z -91.976067
Log I +++++++++++++++++++++++++++++++++++
Log I cpu 122.185 data 158.658 stamp 105311.695 position x -78.974892 y -41.450073 z -92.439568
Log I +++++++++++++++++++++++++++++++++++
Log I cpu 122.781 data 159.664 stamp 105312.701 position x -78.811554 y -41.024845 z -92.079147
Log I +++++++++++++++++++++++++++++++++++
Log I cpu 123.316 data 160.669 stamp 105313.706 position x -78.712463 y -41.123997 z -92.039665
Log I best index: 150, best sc: 0.799538
Log I local loop: 147, 163, 0.799538
Log I cpu 123.863 data 161.762 stamp 105314.799 position x -78.210663 y -40.364994 z -90.860321
Log I cpu 124.352 data 162.781 stamp 105315.818 position x -76.923508 y -38.255119 z -87.836990
Log I cpu 125.044 data 163.868 stamp 105316.905 position x -75.146988 y -35.503147 z -83.494148
Log I cpu 125.687 data 164.892 stamp 105317.929 position x -73.887291 y -34.155991 z -80.787292
Log I cpu 126.301 data 165.961 stamp 105318.998 position x -72.477829 γ -33.911373 z -77.621452
Log I stamp 105319.961189 v (2.347880, -0.179563, 5.226792)
Log I Exit: pose has drifted!!!

ENDÓ	11-	图 建图飘	K log	1	100
00	🕍 Slam解算参数设置				>
2	参数				
	建图类型	○ 原始建图	○ 建图优化		
	建图算法	○ 快速模式	◎ 高精度		
	使用设备	○ 使用GPU	◯ 使用CPV		
	采集稳定度【1-5】	5		-	]
	忽略数据段	0.00		*	秒
	数据段时长	160  00		•	秒
	点云定向	〇 刚体	◎ 非刚体		
	其他结果	□ 全景图	□ 赋色点云		
	其他设置	□ 首尾同点	🗹 建图实时显示		
			确定	取消	š i

			确定	取消	
	图角	<mark>解算前半段数</mark>	据参数设置	×	
FEIMA	Signification           参数           建图类型           建图算法           使用设备           采集稳定度[1-6]           忽略教想段           数据段时长           点云定向           其他结果	<ul> <li>原始建图</li> <li>●快速模式</li> <li>●使用GPU</li> <li>1</li> <li>170.00</li> <li>0.00</li> <li>○別体</li> <li>○全県図</li> </ul>	<ul> <li>建图优化</li> <li>高精度</li> <li>使用CPU</li> <li>非利体</li> <li>赋色点云</li> </ul>	◆ ◆ ◆ 秒	5
	其他设置	□ 首尾同点	☑ 建图实时显示 确定	取消	



#### 6.4 解算提示控制点数量不一致

如在工程创建时导入控制点文件,解算时提示"控制点与提取点数量不一致, 请编辑控制点!"时,则需要用到控制点编辑功能。

> [10:02:07] 点云数据准备中... [10:15:56] 控制点与提取点数量不一致,请编辑控制点! [10:15:57] 点云定向失败! [10:15:57] 解算失败!

> > 图 控制点数量不一致提示提示

在【数据管理窗口】-【控制点数据】-【控制点】处右键单击,选择【编辑 控制点】,进入控制点编辑界面。

1)匹配点数量多于控制点时,则可点击待编辑的控制点,在上方工具条处 修改匹配点序号,将控制点与正确的匹配点对应,使多余的匹配点在最后轮空即 可,其将不参与任何计算,勾选控制点为检查点时,此点不再参与定向计算,仅 作为检查点输出外符合精度报告。控制点编辑后点击应用,点击数据处理工具栏 的【一键解算】,选择不替换已有建图成果,输出定向并优化后成果数据。

2) 控制点数量大于匹配点数量,则需编辑控制点文件,删除多余的控制点。

3)如果后续坐标转换使用非刚性转换,必须将控制点顺序编辑与匹配点顺 序一致,不能使用控制点编辑功能。

控制点名称: 2 参考控制点:	匹配点序号:	2 X: 5	<b>.</b> 40	9 Y:	4 .504 匹配控制	Z: -4.784 則点:	x: 39.	133 y: 56.3	3 z:
								+2	
控制点名称	匹配点床号		-	控制点X	控制点Y	控制点Z	匹配点x	匹配点y	pt
控制点名称	匹配点序号 1		5	控制点X 34.077	控制点Y 4 ?1.254	控制点Z -4.78	匹配点x 27.384	<b>匹配点y</b> -0.901	-1.388
控制点名称 1 1 2 2	<b>匹配点序号</b> 1 2		5	控制点X 14.077 i5.409	控制点Y 4 21.254 4 75.504	控制点Z -4.78 -4.784	<b>尼私志×</b> 27.384 39.133	<b>単紀会y</b> -0.901 56.33	-1.388 -1.373
控制点名称 1 1 2 2 3 3	匹配点序号 1 2 3		5 5 5 5	控制点X )4.077 )5.409 )9.594	控制点Y 4 ?1.254 4 ?5.504 4 38.166	控制点Z -4.78 -4.784 -4.762	<b>世紀</b> 岳x 27.384 39.133 -8.218	<b>胆配症y</b> -0.901 56.33 60.889	-1.388 -1.373 -1.37
控制点名称 1 1 2 2 3 3 4 4	匹配点序号 1 2 3 4	◆ ◆ ● ● ● ● ● ● ● ● ● ● ● ● ●	5 5 5 5	控制点X 14.077 35.409 99.594 34.184	控制点Y 4 21.254 4 75.504 4 38.166 4 37.023	控制点Z -4.78 -4.784 -4.762 -4.813	<b>世紀志</b> 27.384 39.133 - 8.218 - 62.754		-1.388 -1.373 -1.37 -1.452

图 控制点编辑 32



### 6.5 一键解算进度条无变化

ROBOTICS

点击一键解算或点云建图后软件下方进度条无变化,也没有提示解算失败。 此时,打开 imu 文件,查看最后一行是否记录完全,若没有记录完全,删掉最后 一行记录,重新解算即可。

文件(F) 編編(E) 悟式(O) 重濁(V) 種助(H) 458035.196015,0.597412,-0.114703,9.943327,0.009578,0.077156,-0.042569,0.972745,0.005466,-0.034665,0.221726 458035.197015,0.559178,-0.043014,9.893145,0.007450,0.076092,-0.039908,0.972749,0.005447,-0.034564,0.221727 458035.198015,0.511385,-0.035845,9.881196,0.006917,0.073964,-0.032991,0.972755,0.005425,-0.034429,0.221728 458035.199015,0.618919,-0.112313,10.029355,0.008514,0.073432,-0.025009,0.972755,0.005323,-0.034364,0.221731 458035.200015,0.664322,-0.097976,10.000679,0.011174,0.075028,-0.021817,0.972756,0.005223,-0.034262,0.221731 458035.2015,0.485099,-0.160106,9.859690,0.012771,0.072367,-0.022881,0.972765,0.005527,-0.034084,0.221737 458035.202015,0.485099,-0.160106,9.859690,0.012771,0.072367,-0.022881,0.972765,0.00527,-0.034081,0.221742 458035.203015,0.578295,-0.205510,9.924210,0.010642,0.072367,-0.019688,0.972765,0.004927,-0.034081,0.221742 458035.206015,0.5014885,-0.164886,9.807117,0.010110,0.072899,-0.012239,0.972766,0.004829,-0.0334029,0.221745 458035.206015,0.511385,-0.150548,9.893145,0.013303,0.073964,-0.004257,0.972770,0.004829,-0.033920,0.221745 458035.206015,0.5014581,-0.169665,10.132110,0.015431,0.076092,0.003193,0.972771,0.004483,-0.033871,0.221752 458035.206015,0.571126,-0.250913,9.788000,0.018624,0.072367,0.02541,0.972770,0.004482,-0.033912,0.221755 458035.200015,0.427747,-0.258082,9.917041,0.02020,0.072899,0.032459,0.972770,0.004483,-0.033871,0.221761 458035.210015,0.451644,-0.234186,10.026965,0.020752,0.076624,0.03748,0.972779,0.0034721,0.221768 458035.211015,0.545164,-0.234186,10.025095,0.02752,0.076624,0.03748,0.972779,0.003404,-0.033581,0.221787 458035.214015,0.528012,-0.230073,0.111292,0.026606,0.077683,0.07077,0.972780,0.03367,0.23353,0.221797 458035.214015,0.528012,-0.23675,9.842962,0.031395,0.076624,0.03748,0.972779,0.003197,-0.033349,0.221797 458035.214015,0.528012,-0.36575,9.842962,0.031395,0.076624,0.087799,0.972784,0.03283,-0.033316,0.221808 458035.214015,0.578295,-0.236575,9.842962,0.031395,0.076624,0.087799,0.972784,0.03228,-0.03331	/////////////////////////////////////
458035.196015,0.597412,-0.114703,9.943327,0.009578,0.077156,-0.042569,0.972745,0.005466,-0.034665,0.221726 458035.197015,0.559178,-0.043014,9.893145,0.007450,0.076092,-0.039990,0.972754,0.005427,-0.034564,0.221727 458035.199015,0.511385,-0.035845,9.881196,0.006917,0.073964,-0.032991,0.972754,0.005425,-0.034429,0.221730 458035.199015,0.618919,-0.112313,10.029355,0.008514,0.073432,-0.025009,0.972755,0.005323,-0.034364,0.221731 458035.200015,0.664322,-0.097976,10.000679,0.011174,0.073964,-0.022349,0.972756,0.005323,-0.034364,0.221731 458035.202015,0.485099,-0.160106,9.859690,0.012771,0.072367,-0.022881,0.972763,0.005157,-0.034134,0.221737 458035.202015,0.485099,-0.160106,9.859690,0.012771,0.072367,-0.02881,0.972763,0.005157,-0.034134,0.221742 458035.203015,0.578295,-0.205510,9.924210,0.010642,0.072367,-0.019688,0.972765,0.005027,-0.034081,0.221742 458035.204015,0.580685,-0.164886,9.807117,0.01010,0.072899,-0.012239,0.972760,0.004827,-0.034081,0.221745 458035.205015,0.511385,-0.150548,9.893145,0.013303,0.073964,-0.004257,0.972770,0.004482,-0.03392,0.221745 458035.206015,0.604581,-0.169665,10.132110,0.0176431,0.076092,0.003193,0.972771,0.004734,-0.033874,0.221755 458035.206015,0.571126,-0.250913,9.788000,0.018624,0.072367,0.025541,0.972770,0.004482,-0.033912,0.221755 458035.209015,0.427747,-0.258082,9.917041,0.020220,0.072859,0.972775,0.004299,-0.033721,0.221761 458035.210015,0.451644,-0.234186,10.026965,0.020752,0.076624,0.037248,0.972770,0.004483,-0.033871,0.221787 458035.211015,0.54619,-0.272402,9.852521,0.020220,0.077853,0.04467,0.972770,0.004483,-0.033514,0.221787 458035.213015,0.580685,-0.238965,10.041303,0.025080,0.05257,0.972780,0.00376,-0.033531,0.221787 458035.213015,0.580685,-0.238965,10.041303,0.025090,0.075028,0.062257,0.972780,0.00376,-0.033514,0.221787 458035.214015,0.58112,-0.200730,10.113992,0.026606,0.077688,0.070771,0.972780,0.003550,-0.033403,0.221797 458035.215015,0.552009,-0.243744,9.895535,0.029266,0.078753,0.080349,0.972783,0.003411,-0.033849,0.221803 458035.216015,0.580685	文件(F) 编辑(E) 格式(O) 查看(V) 帮助(H)
458035.197015,0.559178,-0.043014,9.893145,0.007450,0.076092,-0.039908,0.972749,0.005447,-0.034564,0.221727 458035.198015,0.511385,-0.035845,9.881196,0.006917,0.073964,-0.032901,0.972754,0.005425,-0.034429,0.221728 458035.200015,0.664322,-0.097976,10.000679,0.01174,0.075028,-0.021817,0.972756,0.005323,-0.034364,0.221731 458035.201015,0.537671,-0.083638,9.831014,0.012771,0.073964,-0.022349,0.972759,0.005272,-0.034262,0.221733 458035.202015,0.485099,-0.160106,9.859690,0.012771,0.072367,-0.022881,0.972763,0.005157,-0.034134,0.221737 458035.204015,0.580685,-0.164886,9.807117,0.0101642,0.072367,-0.019688,0.972765,0.005027,-0.034081,0.221742 458035.204015,0.580685,-0.164886,9.807117,0.010110,0.072899,-0.012239,0.972766,0.004927,-0.034020,0.221745 458035.205015,0.511385,-0.150548,9.893145,0.013303,0.073964,-0.004257,0.972770,0.004829,-0.033920,0.221749 458035.206015,0.604581,-0.169665,10.132110,0.015431,0.076092,0.003193,0.972771,0.004734,-0.033874,0.221752 458035.209015,0.451146,-0.250913,9.788000,0.018624,0.072367,0.025541,0.972770,0.004642,-0.033912,0.221755 458035.209015,0.477747,-0.258082,9.917041,0.020220,0.072890,0.032459,0.972775,0.004483,-0.033871,0.221761 458035.209015,0.427747,-0.258082,9.917041,0.020220,0.078624,0.037248,0.972779,0.004443,-0.033871,0.221765 458035.210015,0.451644,-0.234186,10.026965,0.020752,0.076624,0.037248,0.972779,0.004443,-0.033821,0.221781 458035.210015,0.451644,-0.234186,10.026965,0.02075028,0.062257,0.972770,0.004443,-0.033531,0.221781 458035.210015,0.580685,-0.238056,10.041303,0.025009,0.070288,0.622577,0.972780,0.003570,-0.033534,0.221797 458035.210015,0.580685,-0.238055,0.04305,0.02752,0.076624,0.037748,0.003370,-0.033534,0.221797 458035.214015,0.528012,-0.200730,10.112992,0.026060,0.077688,0.070771,0.972783,0.003411,-0.03349,0.221803 458035.214015,0.578295,-0.236575,9.842962,0.031395,0.076624,0.087793,0.003411,-0.03349,0.221803 458035.216015,0.578295,-0.236575,9.842962,0.031395,0.076624,0.087930,972790,0.003191,-0.033403,0.221797 458035.216015,0.580685,-0.2365	458035.196015,0.597412,-0.114703,9.943327,0.009578,0.077156,-0.042569,0.972745,0.005466,-0.034665,0.221726
458035.198015,0.511385,-0.035845,9.881196,0.006917,0.073964,-0.032991,0.972754,0.005425,-0.034429,0.221728 458035.199015,0.618919,-0.112313,10.029355,0.008514,0.073432,-0.025009,0.972755,0.005364,-0.034380,0.221730 458035.200015,0.664322,-0.097976,10.000679,0.011174,0.075028,-0.021817,0.972756,0.005323,-0.034262,0.221733 458035.202015,0.485099,-0.160106,9.859690,0.012771,0.073964,-0.022349,0.972759,0.005272,-0.034262,0.221733 458035.202015,0.485099,-0.160106,9.859690,0.012771,0.072367,-0.022881,0.972763,0.005157,-0.034134,0.221742 458035.202015,0.485099,-0.160106,9.859690,0.012771,0.072367,-0.019688,0.972765,0.005027,-0.034029,0.221745 458035.202015,0.511385,-0.150548,9.893145,0.01303,0.073964,-0.004257,0.972770,0.004429,-0.03302,0.221745 458035.205015,0.0511385,-0.150548,9.893145,0.01303,0.073964,-0.004257,0.972771,0.004429,-0.033874,0.221752 458035.205015,0.604581,-0.16965,10.132110,0.015431,0.076092,0.003193,0.972771,0.004462,-0.033874,0.221755 458035.207015,0.707336,-0.191172,10.00369,0.017028,0.075028,0.013835,0.972770,0.004642,-0.033912,0.221755 458035.209015,0.427747,-0.258082,9.917041,0.20220,0.07289,0.032459,0.972775,0.004299,-0.033721,0.221761 458035.210015,0.451644,-0.234186,10.026965,0.020752,0.076624,0.037248,0.972779,0.004443,-0.033874,0.221775 458035.210015,0.451644,-0.234186,10.026965,0.020752,0.076624,0.03748,0.972779,0.004443,-0.03352,0.221775 458035.210015,0.451644,-0.234186,10.026965,0.020752,0.076624,0.03748,0.972779,0.004440,-0.033582,0.221775 458035.210015,0.580685,-0.238965,10.041303,0.025009,0.075028,0.062257,0.972780,0.00362,-0.033402,0.221781 458035.213015,0.580685,-0.238965,10.041303,0.025009,0.075028,0.062257,0.972780,0.003662,-0.033403,0.221781 458035.214015,0.580685,-0.238965,10.041303,0.025009,0.075028,0.06227,0.972780,0.003662,-0.033403,0.221781 458035.214015,0.580685,-0.2389555,0.029266,0.078753,0.008779,0.972780,0.003662,-0.033403,0.221803 458035.214015,0.538292,-0.136210,9.950497,0.033523,0.078753,0.0094184,0.9727780,0.003455,-0.033403,0.221803 458035.216015,0.580685,-0.08124	458035.197015,0.559178,-0.043014,9.893145,0.007450,0.076092,-0.039908,0.972749,0.005447,-0.034564,0.221727
458035.199015,0.618919,-0.112313,10.029355,0.008514,0.073432,-0.025009,0.972755,0.005364,-0.034380,0.221730 458035.200015,0.664322,-0.097976,10.000679,0.011174,0.075028,-0.021817,0.972756,0.005323,-0.034364,0.221731 458035.201015,0.485099,-0.160106,9.859690,0.012771,0.07364,-0.022849,0.972763,0.005157,-0.034134,0.221737 458035.202015,0.485099,-0.164866,9.807117,0.010642,0.072367,-0.019688,0.972765,0.005027,-0.034081,0.221742 458035.204015,0.580685,-0.164886,9.807117,0.010110,0.072899,-0.012239,0.972766,0.004927,-0.034029,0.221745 458035.205015,0.511385,-0.150548,9.893145,0.013303,0.073964,-0.004257,0.972770,0.004829,-0.033920,0.221749 458035.206015,0.604581,-0.169665,10.132110,0.015431,0.076092,0.003193,0.972771,0.004734,-0.033874,0.221752 458035.207015,0.707336,-0.191172,10.003069,0.017028,0.075028,0.013835,0.972770,0.004482,-0.033912,0.221755 458035.208015,0.571126,-0.250913,9.788000,0.018624,0.072367,0.025541,0.972770,0.004483,-0.033871,0.221761 458035.209015,0.427747,-0.258082,9.917041,0.020220,0.07853,0.04469,0.972779,0.004443,-0.033581,0.221775 458035.210015,0.451644,-0.234186,10.026965,0.020752,0.076624,0.037248,0.972779,0.004440,-0.033581,0.221781 458035.211015,0.549619,-0.272420,9.852521,0.020220,0.07853,0.04469,0.972779,0.004140,-0.033581,0.221781 458035.212015,0.614140,-0.296316,9.799949,0.022349,0.076624,0.053743,0.972779,0.003766,-0.033531,0.221781 458035.213015,0.580685,-0.238965,10.041303,0.025009,0.075028,0.062257,0.972780,0.003970,-0.033534,0.221797 458035.214015,0.528112,-0.200730,10.112992,0.026606,0.077683,0.080349,0.9727783,0.003411,-0.033403,0.221797 458035.215015,0.552009,-0.243744,9.89553,0.02966,0.078753,0.084489,0.9727784,0.003283,-0.033403,0.221797 458035.215015,0.532892,-0.136210,9.950497,0.033523,0.078753,0.094184,0.972786,0.003283,-0.033403,0.221803 458035.215015,0.532892,-0.136210,9.950497,0.033523,0.078753,0.094184,0.972786,0.003283,-0.033403,0.221811 458035.218015,0.485099,-0.081248,9.914652,0.034055,0.078221,0.11633,0.972793,0.003171,-0.032993,0.221811 458035	458035.198015,0.511385,-0.035845,9.881196,0.006917,0.073964,-0.032991,0.972754,0.005425,-0.034429,0.221728
458035.200015,0.664322,-0.097976,10.000679,0.011174,0.075028,-0.021817,0.972756,0.005323,-0.034364,0.221731 458035.201015,0.537671,-0.083638,9.831014,0.012771,0.073964,-0.022349,0.972759,0.005272,-0.034262,0.221733 458035.202015,0.485099,-0.160106,9.859690,0.012771,0.072367,-0.022881,0.972763,0.005157,-0.034134,0.221737 458035.203015,0.578295,-0.205510,9.924210,0.010642,0.072367,-0.019688,0.972765,0.005027,-0.034081,0.221742 458035.204015,0.580685,-0.164886,9.807117,0.010110,0.072899,-0.012239,0.972766,0.004927,-0.034029,0.221745 458035.205015,0.511385,-0.150548,9.893145,0.013303,0.073964,-0.004257,0.972770,0.004829,-0.033920,0.221749 458035.206015,0.604581,-0.169665,10.132110,0.015431,0.076092,0.003193,0.972771,0.004734,-0.033874,0.221752 458035.207015,0.707336,-0.191172,10.003069,0.017028,0.075028,0.013835,0.972770,0.004642,-0.033912,0.221755 458035.209015,0.427747,-0.258082,9.917041,0.020220,0.072899,0.032459,0.972775,0.004299,-0.033721,0.221761 458035.210015,0.427747,-0.258082,9.917041,0.020220,0.078753,0.04467,0.972779,0.004140,-0.033582,0.221775 458035.210015,0.451644,-0.234186,10.026965,0.020752,0.076624,0.037248,0.972779,0.004140,-0.033582,0.221775 458035.210015,0.549619,-0.272420,9.852521,0.020220,0.078753,0.044697,0.972780,0.003970,-0.033531,0.221781 458035.213015,0.549619,-0.272420,9.852521,0.020220,0.078753,0.04467,0.972780,0.003662,-0.033403,0.221787 458035.213015,0.580685,-0.238965,10.041303,0.025009,0.075028,0.062257,0.972780,0.033550,-0.033403,0.221797 458035.215015,0.552009,-0.243744,9.895535,0.029266,0.077683,0.08349,0.972783,0.003411,-0.033403,0.221797 458035.215015,0.532892,-0.136210,9.950497,0.033523,0.078753,0.094184,0.972786,0.003283,-0.033403,0.221797 458035.215015,0.532892,-0.136210,9.950497,0.033523,0.078753,0.094184,0.972786,0.003283,-0.033403,0.221801 458035.218015,0.485099,-0.081248,9.914652,0.034055,0.078753,0.094184,0.972786,0.003283,-0.03323,0.0,221811 458035.218015,0.485099,-0.081248,9.914652,0.034055,0.078221,0.101633,0.972793,0.003171,-0.033929,0.221816 458035.220015,0.580685,	458035.199015,0.618919,-0.112313,10.029355,0.008514,0.073432,-0.025009,0.972755,0.005364,-0.034380,0.221730
458035.201015,0.537671,-0.083638,9.831014,0.012771,0.073964,-0.022349,0.972759,0.005272,-0.034262,0.221733 458035.202015,0.485099,-0.160106,9.859690,0.012771,0.072367,-0.022881,0.972763,0.005157,-0.034134,0.221737 458035.203015,0.578295,-0.205510,9.924210,0.010642,0.072367,-0.019688,0.972765,0.005027,-0.034081,0.221742 458035.204015,0.580685,-0.164886,9.807117,0.010110,0.072899,-0.012239,0.972766,0.004927,-0.034029,0.221745 458035.205015,0.511385,-0.150548,9.893145,0.013303,0.073964,-0.004257,0.972770,0.004829,-0.033920,0.221749 458035.206015,0.604581,-0.169665,10.132110,0.015431,0.076092,0.003193,0.972771,0.004734,-0.033874,0.221752 458035.207015,0.707336,-0.191172,10.003069,0.017028,0.075028,0.013835,0.972770,0.004642,-0.033912,0.221755 458035.208015,0.571126,-0.250913,9.788000,0.018624,0.072367,0.025541,0.972770,0.004483,-0.033871,0.221761 458035.209015,0.427747,-0.258082,9.917041,0.020220,0.072899,0.032459,0.972779,0.004483,-0.033582,0.221775 458035.210015,0.451644,-0.234186,10.026965,0.020752,0.076624,0.037248,0.972779,0.004140,-0.033582,0.221775 458035.212015,0.614140,-0.296316,9.799949,0.022349,0.076624,0.03743,0.972779,0.003490,-0.033531,0.221781 458035.212015,0.580685,-0.238965,10.041303,0.025009,0.075028,0.062257,0.972780,0.003970,-0.033534,0.221787 458035.214015,0.528112,-0.200730,10.112992,0.026606,0.077688,0.070771,0.972782,0.003550,-0.033493,0.221793 458035.216015,0.552009,-0.243744,9.895535,0.029266,0.078753,0.080349,0.972783,0.003411,-0.033349,0.221803 458035.216015,0.578295,-0.236575,9.842962,0.031395,0.076624,0.087790,9.972784,0.003283,-0.033316,0.221808 458035.216015,0.578295,-0.236575,9.842962,0.031395,0.076624,0.087790,9.972784,0.003283,-0.033316,0.221808 458035.216015,0.578295,-0.236575,9.842962,0.031395,0.076753,0.094184,0.972784,0.003283,-0.033316,0.221808 458035.218015,0.485099,-0.081248,9.914652,0.034055,0.078221,0.101633,0.972793,0.003171,-0.03390,0.221811 458035.219015,0.580685,-0.052572,10.029355,0.034055,0.078221,0.101633,0.972793,0.003171,-0.032993,0.221816 458035.220015,0.580685,	458035.200015,0.664322,-0.097976,10.000679,0.011174,0.075028,-0.021817,0.972756,0.005323,-0.034364,0.221731
458035.202015,0.485099,-0.160106,9.859690,0.012771,0.072367,-0.022881,0.972763,0.005157,-0.034134,0.221737 458035.203015,0.578295,-0.205510,9.924210,0.010642,0.072367,-0.019688,0.972765,0.005027,-0.034081,0.221742 458035.204015,0.580685,-0.164886,9.807117,0.010110,0.072899,-0.012239,0.972766,0.004927,-0.034029,0.221745 458035.205015,0.511385,-0.150548,9.893145,0.013303,0.073964,-0.004257,0.972770,0.004829,-0.033920,0.221749 458035.206015,0.604581,-0.169665,10.132110,0.015431,0.076092,0.003193,0.972771,0.004734,-0.033874,0.221755 458035.207015,0.707336,-0.191172,10.003069,0.017028,0.075028,0.013835,0.972770,0.004483,-0.033874,0.221755 458035.208015,0.571126,-0.250913,9.788000,0.018624,0.072367,0.025541,0.972770,0.004483,-0.033871,0.221761 458035.209015,0.427747,-0.258082,9.917041,0.020220,0.072899,0.032459,0.972775,0.004299,-0.033721,0.221768 458035.210015,0.451644,-0.234186,10.026965,0.020752,0.076624,0.037248,0.972779,0.004140,-0.033582,0.221775 458035.210015,0.451644,-0.234186,10.026965,0.020752,0.076624,0.037248,0.972779,0.003970,-0.033531,0.221781 458035.212015,0.614140,-0.296316,9.799949,0.022349,0.076624,0.053743,0.972779,0.003796,-0.033534,0.221787 458035.213015,0.580685,-0.238965,10.041303,0.025009,0.075088,0.07071,0.972780,0.003662,-0.033492,0.221793 458035.214015,0.528112,-0.200730,10.112992,0.026606,0.077688,0.07071,0.972782,0.003550,-0.033492,0.221803 458035.216015,0.578295,-0.236575,9.842962,0.031395,0.076624,0.087799,0.972784,0.003283,-0.033316,0.221808 458035.216015,0.578295,-0.236575,9.842962,0.031395,0.076624,0.087799,0.972784,0.003283,-0.033316,0.221808 458035.216015,0.578295,-0.236575,9.842962,0.031395,0.076624,0.087799,0.972784,0.003283,-0.033310,0.221808 458035.216015,0.578295,-0.236575,9.842962,0.031395,0.076624,0.087799,0.97278,0.003283,-0.033310,0.221808 458035.217015,0.538685,-0.052572,10.029355,0.034055,0.078	458035.201015,0.537671,-0.083638,9.831014,0.012771,0.073964,-0.022349,0.972759,0.005272,-0.034262,0.221733
458035.203015,0.578295,-0.205510,9.924210,0.010642,0.072367,-0.019688,0.972765,0.005027,-0.034081,0.221742 458035.204015,0.580685,-0.164886,9.807117,0.010110,0.072899,-0.012239,0.972766,0.004927,-0.034029,0.221745 458035.205015,0.511385,-0.150548,9.893145,0.013303,0.073964,-0.004257,0.972770,0.004829,-0.033920,0.221749 458035.206015,0.604581,-0.169665,10.132110,0.015431,0.076092,0.003193,0.972771,0.004734,-0.033874,0.221752 458035.207015,0.707336,-0.191172,10.003069,0.017028,0.075028,0.013835,0.972770,0.004482,-0.033912,0.221755 458035.208015,0.571126,-0.250913,9.788000,0.018624,0.072367,0.025541,0.972770,0.004483,-0.033871,0.221761 458035.209015,0.427747,-0.258082,9.917041,0.020220,0.072899,0.032459,0.972775,0.004299,-0.033721,0.221768 458035.210015,0.451644,-0.234186,10.026965,0.020752,0.076624,0.037248,0.972779,0.004140,-0.033582,0.221775 458035.210015,0.451644,-0.234186,10.026965,0.020752,0.076624,0.037248,0.972779,0.003970,-0.033531,0.221781 458035.212015,0.614140,-0.296316,9.799949,0.022349,0.076624,0.053743,0.972779,0.003796,-0.033534,0.221787 458035.213015,0.580685,-0.238965,10.041303,0.025009,0.075088,0.070771,0.972780,0.003662,-0.033492,0.221793 458035.214015,0.558082,-0.238965,10.041303,0.025009,0.077688,0.070771,0.972782,0.003550,-0.033403,0.221797 458035.215015,0.552009,-0.243744,9.895535,0.029266,0.077688,0.070771,0.972782,0.003411,-0.03349,0.221803 458035.216015,0.578295,-0.236575,9.842962,0.031335,0.076624,0.087799,0.972784,0.003283,-0.033316,0.221803 458035.216015,0.578295,-0.236575,9.842962,0.031335,0.076624,0.087799,0.972784,0.003283,-0.033340,0.221803 458035.216015,0.578295,-0.236575,9.842962,0.031395,0.076624,0.087799,0.972784,0.003283,-0.033316,0.221808 458035.217015,0.532892,-0.136210,9.950497,0.033523,0.078753,0.094184,0.972786,0.003223,-0.033230,0.221811 458035.218015,0.485099,-0.081248,9.914652,0.034055,0.078531,0.094784,0.97279,0.003197,-0.033102,0.221814 458035.219015,0.506605,-0.086027,9.890755,0.034055,0.078	458035.202015,0.485099,-0.160106,9.859690,0.012771,0.072367,-0.022881,0.972763,0.005157,-0.034134,0.221737
458035.204015,0.580685,-0.164886,9.807117,0.010110,0.072899,-0.012239,0.972766,0.004927,-0.034029,0.221745 458035.205015,0.511385,-0.150548,9.893145,0.013303,0.073964,-0.004257,0.972770,0.004829,-0.033920,0.221749 458035.206015,0.604581,-0.169665,10.132110,0.015431,0.076092,0.003193,0.972771,0.004734,-0.033874,0.221752 458035.208015,0.707336,-0.191172,10.003069,0.017028,0.075028,0.013835,0.972770,0.004642,-0.033912,0.221755 458035.208015,0.571126,-0.250913,9.788000,0.018624,0.072367,0.025541,0.972770,0.004483,-0.033871,0.221761 458035.209015,0.427747,-0.258082,9.917041,0.020220,0.072899,0.032459,0.972775,0.004299,-0.033721,0.221768 458035.210015,0.451644,-0.234186,10.026965,0.020752,0.076624,0.037248,0.972779,0.004140,-0.033582,0.221775 458035.210015,0.451644,-0.234186,10.026965,0.020752,0.076624,0.037248,0.972779,0.004140,-0.033581,0.221761 458035.210015,0.549619,-0.272420,9.852521,0.020220,0.078753,0.044697,0.972780,0.003970,-0.033531,0.221781 458035.212015,0.614140,-0.296316,9.799949,0.022349,0.076624,0.053743,0.972779,0.003796,-0.033534,0.221787 458035.213015,0.580685,-0.238965,10.041303,0.025009,0.075028,0.062257,0.972780,0.003662,-0.033490,2.221793 458035.214015,0.5528112,-0.200730,10.112992,0.026606,0.077688,0.070771,0.972782,0.003550,-0.033403,0.221797 458035.215015,0.552009,-0.243744,9.895535,0.029266,0.0776853,0.080349,0.972783,0.003411,-0.03349,0.221803 458035.216015,0.578295,-0.236575,9.842962,0.031395,0.076624,0.087799,0.972784,0.003283,-0.033316,0.221808 458035.217015,0.532892,-0.136210,9.95047,0.033523,0.078753,0.094184,0.972786,0.003223,-0.033230,0.221801 458035.218015,0.485099,-0.081248,9.914652,0.034055,0.07853,0.094184,0.972780,0.003197,-0.033102,0.221814 458035.219015,0.506605,-0.086027,9.890755,0.034055,0.078221,0.101633,0.972793,0.003171,-0.032993,0.221816 458035.220015,0.580685,-0.052572,10.029355,0.034055,0.078	458035.203015,0.578295,-0.205510,9.924210,0.010642,0.072367,-0.019688,0.972765,0.005027,-0.034081,0.221742
458035.205015,0.511385,-0.150548,9.893145,0.013303,0.073964,-0.004257,0.972770,0.004829,-0.033920,0.221749 458035.206015,0.604581,-0.169665,10.132110,0.015431,0.076092,0.003193,0.972771,0.004734,-0.033874,0.221752 458035.207015,0.707336,-0.191172,10.003069,0.017028,0.075028,0.013835,0.972770,0.004642,-0.033912,0.221755 458035.209015,0.427747,-0.258082,9.917041,0.020220,0.072899,0.032459,0.972775,0.004299,-0.033721,0.221768 458035.210015,0.427747,-0.258082,9.917041,0.020220,0.076624,0.037248,0.972779,0.004140,-0.033582,0.221775 458035.210015,0.451644,-0.234186,10.026965,0.020752,0.076624,0.037248,0.972779,0.004140,-0.033582,0.221775 458035.210015,0.451644,-0.234186,10.026965,0.020752,0.076624,0.037248,0.972779,0.004140,-0.033582,0.221775 458035.210015,0.549619,-0.272420,9.852521,0.020220,0.078753,0.044697,0.972780,0.003970,-0.033531,0.221781 458035.212015,0.614140,-0.296316,9.799949,0.022349,0.076624,0.053743,0.972779,0.003766,-0.033534,0.221787 458035.213015,0.580685,-0.238965,10.041303,0.025009,0.075028,0.062257,0.972780,0.003662,-0.033492,0.221793 458035.214015,0.5528112,-0.200730,10.112992,0.026606,0.077683,0.080349,0.972782,0.003550,-0.033403,0.221797 458035.215015,0.578295,-0.236575,9.842962,0.031395,0.076624,0.087799,0.972784,0.003283,-0.033140,0.221803 458035.216015,0.578295,-0.236575,9.842962,0.031395,0.076624,0.087799,0.972784,0.003283,-0.033140,0.221803 458035.217015,0.532892,-0.136210,9.950497,0.033523,0.098184,0.972786,0.003223,-0.03316,0.221808 458035.218015,0.485099,-0.081248,9.914652,0.034055,0.080349,0.09873,0.972790,0.03197,-0.033102,0.221811 458035.218015,0.485099,-0.081248,9.914652,0.034055,0.078221,0.101633,0.972793,0.003171,-0.032993,0.221816 458035.220015,0.580685,-0.052572,10.029355,0.034055,0.078	458035.204015,0.580685,-0.164886,9.807117,0.010110,0.072899,-0.012239,0.972766,0.004927,-0.034029,0.221745
458035.206015,0.604581,-0.169665,10.132110,0.015431,0.076092,0.003193,0.972771,0.004734,-0.033874,0.221752 458035.207015,0.707336,-0.191172,10.003069,0.017028,0.075028,0.013835,0.972770,0.004642,-0.033912,0.221755 458035.208015,0.571126,-0.250913,9.788000,0.018624,0.072367,0.025541,0.972770,0.004483,-0.033871,0.221761 458035.209015,0.427747,-0.258082,9.917041,0.020220,0.072899,0.032459,0.972775,0.004299,-0.033721,0.221768 458035.210015,0.451644,-0.234186,10.026965,0.020752,0.076624,0.037248,0.972779,0.004140,-0.033582,0.221775 458035.210015,0.549619,-0.272420,9.852521,0.020220,0.078753,0.044697,0.972780,0.003970,-0.033531,0.221781 458035.212015,0.614140,-0.296316,9.799949,0.022349,0.076624,0.053743,0.972779,0.003706,-0.033534,0.221787 458035.213015,0.580685,-0.238965,10.041303,0.025009,0.075028,0.062257,0.972780,0.003662,-0.033492,0.221793 458035.214015,0.528112,-0.200730,10.112992,0.026606,0.077688,0.070771,0.972782,0.003550,-0.033403,0.221797 458035.215015,0.552009,-0.243744,9.895535,0.029266,0.078753,0.080349,0.972783,0.003411,-0.033349,0.221803 458035.216015,0.578295,-0.236575,9.842962,0.031395,0.076624,0.087799,0.972784,0.003283,-0.033403,0.221797 458035.216015,0.578295,-0.236575,9.842962,0.031395,0.076624,0.087799,0.972784,0.003283,-0.033403,0.221803 458035.217015,0.532892,-0.136210,9.950497,0.033523,0.078753,0.094184,0.972786,0.003223,-0.033230,0.221811 458035.218015,0.485099,-0.081248,9.914652,0.034055,0.078221,0.101633,0.97279,0.003171,-0.032993,0.221814 458035.219015,0.56605,-0.086027,9.890755,0.034055,0.078	458035.205015,0.511385,-0.150548,9.893145,0.013303,0.073964,-0.004257,0.972770,0.004829,-0.033920,0.221749
458035.207015,0.707336,-0.191172,10.003069,0.017028,0.075028,0.013835,0.972770,0.004642,-0.033912,0.221755 458035.208015,0.571126,-0.250913,9.788000,0.018624,0.072367,0.025541,0.972770,0.004483,-0.033871,0.221761 458035.209015,0.427747,-0.258082,9.917041,0.020220,0.072899,0.032459,0.972775,0.004299,-0.033721,0.221768 458035.210015,0.451644,-0.234186,10.026965,0.020752,0.076624,0.037248,0.972779,0.004140,-0.033582,0.221775 458035.211015,0.549619,-0.272420,9.852521,0.020220,0.078753,0.044697,0.972780,0.003970,-0.033531,0.221781 458035.212015,0.614140,-0.296316,9.799949,0.022349,0.076624,0.053743,0.972779,0.003706,-0.033534,0.221787 458035.213015,0.580685,-0.238965,10.041303,0.025009,0.075028,0.062257,0.972780,0.003662,-0.033492,0.221793 458035.214015,0.528112,-0.200730,10.112992,0.026606,0.077688,0.070771,0.972782,0.003550,-0.033403,0.221797 458035.215015,0.552009,-0.243744,9.895535,0.029266,0.078753,0.080349,0.972783,0.003411,-0.033349,0.221803 458035.216015,0.578295,-0.236575,9.842962,0.031395,0.076624,0.087799,0.972784,0.003283,-0.03316,0.221808 458035.217015,0.532892,-0.136210,9.950497,0.033523,0.078753,0.094184,0.972786,0.003223,-0.033230,0.221811 458035.218015,0.485099,-0.081248,9.914652,0.034055,0.080349,0.98973,0.972790,0.003197,-0.033102,0.221814 458035.219015,0.506605,-0.086027,9.890755,0.034055,0.078221,0.101633,0.972793,0.003171,-0.032993,0.221816 458035.220015,0.580685,-0.052572,10.029355,0.034055,0.078	458035.206015,0.604581,-0.169665,10.132110,0.015431,0.076092,0.003193,0.972771,0.004734,-0.033874,0.221752
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