2. Handheld lidar mapping

This function needs to start the program in the slam_gmapping function package. The source code is located in the [yahboomcar_ws] source code. Here we use the supporting virtual machine to explain how to start the program. If you want to put it on your own motherboard, put yahboomcar_ws in the root directory and compile it.

2.1. Start radar

Terminal input,

```
ros2 launch ydlidar_ros2_driver ydlidar_launch.py
```

2.2. Release static odom conversion

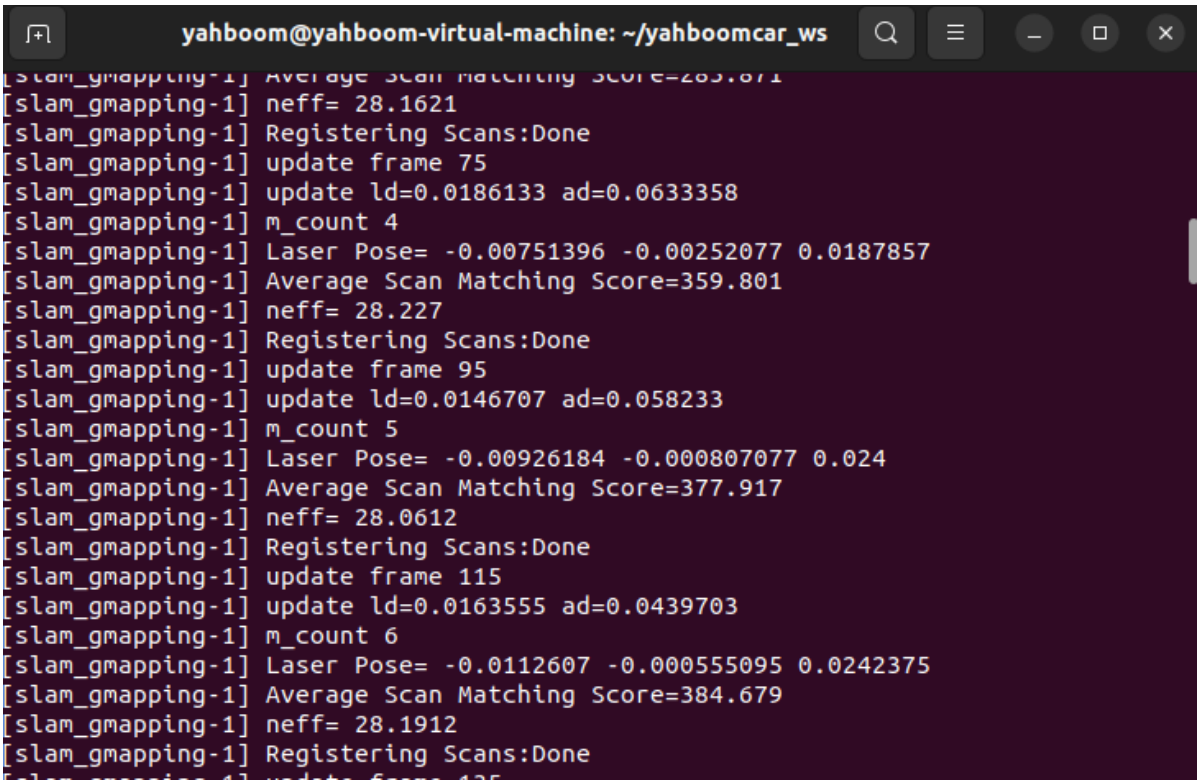
Terminal input,

```
ros2 launch rf2o_laser_odometry rf2o_laser_odometry.launch.py
```

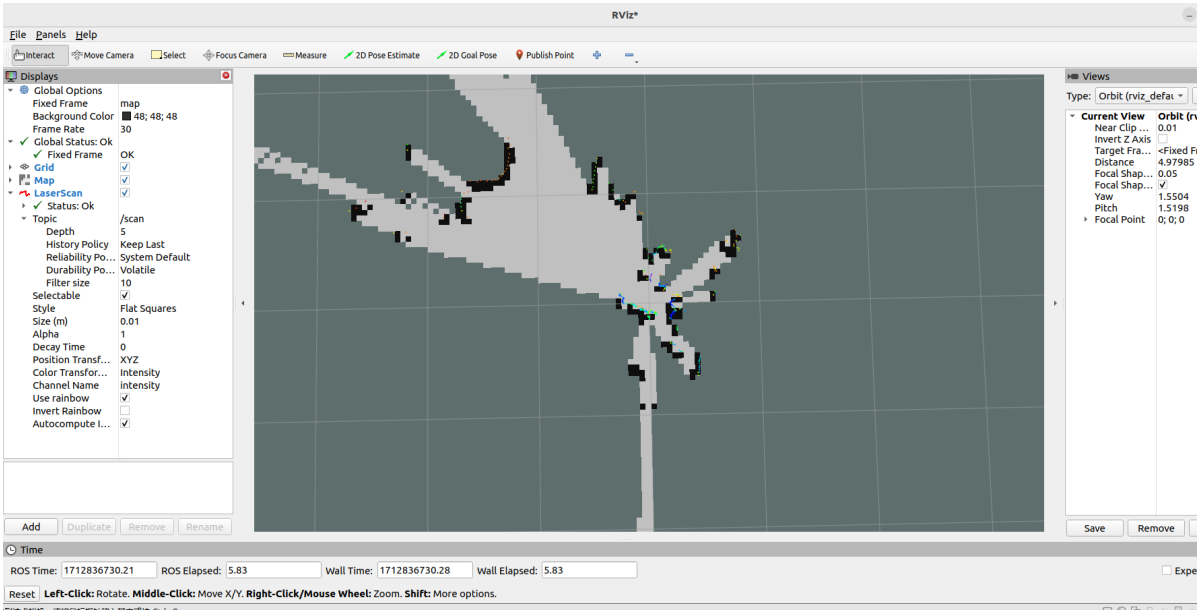
2.3. Start gmapping mapping

Terminal input,

```
ros2 launch slam_gmapping slam_gmapping.launch.py
```



rviz displays as follows,



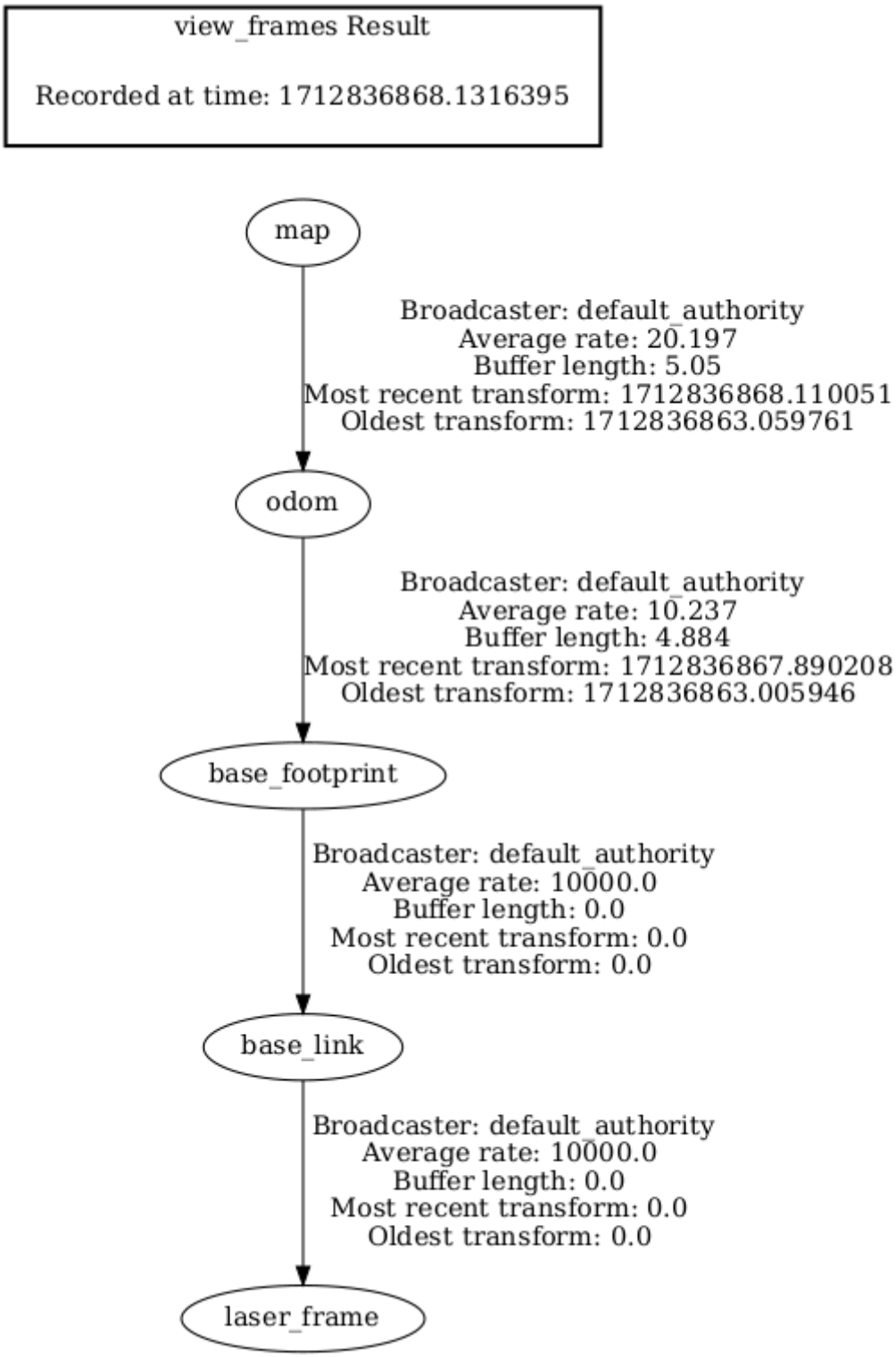
2.4. View TF tree

Terminal input,

```
ros2 run tf2_tools view_frames
```

```
yahboom@yahboom-virtual-machine:~/yahboomcar_ws$ ros2 run tf2_tools view_frames
[INFO] [1712836863.067737751] [view_frames]: Listening to tf data for 5.0 seconds...
[INFO] [1712836868.112822280] [view_frames]: Generating graph in frames.pdf file...
[INFO] [1712836868.118691540] [view_frames]: Result:tf2_msgs.srv.FrameGraph_Response(frame_yaml="odom: \n  parent: 'map'\n  broadcaster: 'default_authority'\n  rate: 20.197\n  most_recent_transform: 1712836868.110051\n  oldest_transform: 1712836863.059761\n  buffer_length: 5.050\nlaser_frame: \n  parent: 'base_link'\n  broadcaster: 'default_authority'\n  rate: 10000.000\n  most_recent_transform: 0.000000\n  oldest_transform: 0.000000\n  buffer_length: 0.000\nbase_link: \n  parent: 'base_footprint'\n  broadcaster: 'default_authority'\n  rate: 10000.000\n  most_recent_transform: 0.000000\n  oldest_transform: 0.000000\n  buffer_length: 0.000\nbase_footprint: \n  parent: 'odom'\n  broadcaster: 'default_authority'\n  rate: 10.237\n  most_recent_transform: 1712836867.890208\n  oldest_transform: 1712836863.005946\n  buffer_length: 4.884\n")
yahboom@yahboom-virtual-machine:~/yahboomcar_ws$
```

A frames.pdf file will be generated in the directory where the command terminal is started. This is the generated TF tree.


view_frames Result
Recorded at time: 1712836868.1316395
map
Broadcaster: default_authority
Average rate: 20.197
Buffer length: 5.05
Most recent transform: 1712836868.110051
Oldest transform: 1712836863.059761
odom
Broadcaster: default_authority
Average rate: 10.237
Buffer length: 4.884
Most recent transform: 1712836867.890208
Oldest transform: 1712836863.005946
base_footprint
Broadcaster: default_authority
Average rate: 10000.0
Buffer length: 0.0
Most recent transform: 0.0
Oldest transform: 0.0
base_link
Broadcaster: default_authority
Average rate: 10000.0
Buffer length: 0.0
Most recent transform: 0.0
Oldest transform: 0.0
laser_frame