



1. How do localization package know the covariance matrix of GPS and radar odometry?

Robot localization pkg's launch file read the parameters from params/.yaml file, where you can tell the launch file which topic you want to subscribe and fuse. And the topics include information of covariance matrix.

2. What is the covariance matrix of GPS and what does it mean?

This means that the correlation between x, x

	x	y	z	row	pitch	yaw
x	3.0, 0.0, 0.0, 0.0, 0.0, 0.0					
y	0.0, 3.0, 0.0, 0.0, 0.0, 0.0					
z	0.0, 0.0, 0.0, 0.0, 0.0, 0.0					
row	0.0, 0.0, 0.0, 0.0, 0.0, 0.0					
pitch	0.0, 0.0, 0.0, 0.0, 0.0, 0.0					
yaw	0.0, 0.0, 0.0, 0.0, 0.0, 0.0					

and y , y is 3. And there arguments will not change in GPS.

3. In the yaml file, do you set differential parameter of odometry and GPS to true ? or false ? why ?

I set differential param of GPS to false because GPS get the car's position (x, y) absolutely with error.

I set differential param of radar odometry to true because radar get the car's position by calculating the difference between position at time t and $(t + \Delta t)$, relative to a specific starting position.