

GPS9-1: Receiver Technology

MM15: November 9, 8.15, room A3-207

Purpose

The purpose of this lecture is to give a brief understanding of the position algorithms. After this lecture the students should have some ideas on how a GPS receiver is calculating positions based on GPS signals.

Subjects

- The idea behind GPS positioning
- Accuracy of GPS measurements
- Finding pseudoranges
- Calculating positions

Problems

For this lecture use the data file called *data_long2.mat*. The mat file contains about 34s of data and is about 280MB large. To load the data file into Matlab do the following:

```
>> load /afs/ies.auc.dk/project/softgps/public/data_long2.mat
```

The mat file is again data collected from the roof antenna, and the sampling frequency is 11.99832MHz.

The exercise is simple: *Try and calculate a position based on the data in the mat file.*

Hints:

1. Make acquisition on the first millisecond of data
2. Track all the available satellites
3. Decode the navigation messages on all the satellites
4. Calculate pseudoranges to all the available satellites
5. Calculate the satellite positions at transmit time
6. Calculate the position based on the pseudoranges and the satellite positions