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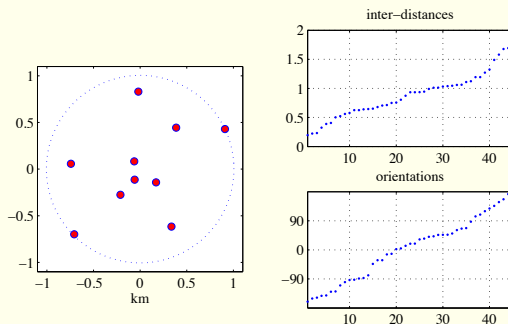


Figure: 45 *sensors pairs*

In a station design the two following elements could be of interest:

- the aperture
- the relative locations of the sensors
 - the uniformity of the inter-distances
 - the isotropy w.r.t. the DOA accuracy

Coherence

We consider a plane wave "not fully spatially coherent" and we assume that the loss of coherence (LOC) is given by

$$\log \text{MSC}(f) \approx -\beta f^2 \times d^2$$

where d is the distance between 2 points of observation, f the frequency and β a LOC decay factor.

CRB

- Cramer-Rao bound (CRB) provides a lower bound to the variance we can expect in the estimation of a parameter of interest (POI).
- If the two POIs are the azimuth and the horizontal velocity, the CRB is a 2 by 2 positive matrix.
- CRB is a function of the true azimuth and the true horizontal velocity, the LOC parameter β , the SNR, the geometry of the station.

IS37, with 10 sensors then 45 interdistances

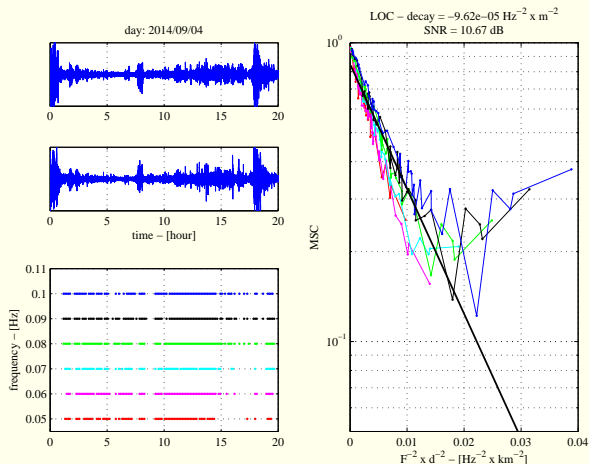


Figure: Top: signals on about 20 hours. Middle: the 11 selected frequencies. A dot means that the MSC on the 3 nearest sensors is over 0.8 for the time window. Bottom: the 11 curves of the MSCs as a function of the interdistances

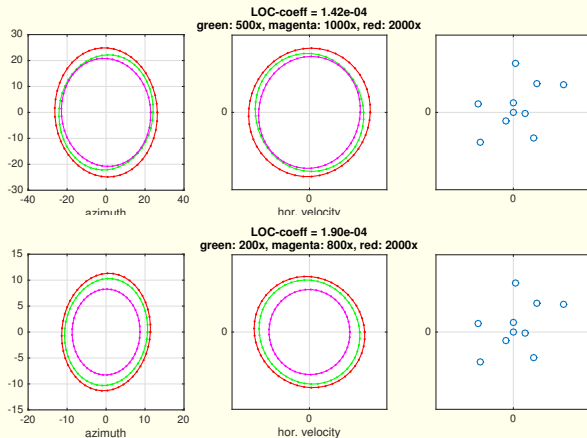


Figure: 500, 1000, 5000 are the aperture multiplicative factor of the I37 template reported on the RHS of the figure. LOC factor is $\beta = 0$ and $\beta = 1.9e^{-4}$. Maximal frequency 0.18 Hz.

In presence of LOC, we see that the precision passes by a optimum for $R = 1000$.