



Session3 Presentation4 (pre-recorded)

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Optimizing DORIS station distribution

Ensuring a homogeneous distribution of DORIS stations: a fundamental objective for the network

Indeed, geographic homogeneity of the network is a key characteristic of DORIS, it is the first quality emphasized by geodetic scientists. The DORIS Network is well balanced in latitude and longitude, which allows global observations and prevent from local systematisms.

To make it very simple, if all the stations were located in Europe, the network would be much easier to maintain, but would produce biases for geodesy. This is why a great care has been taken to cover the largest part of the Earth surface, by separating as much as possible each station one from another.

This equilibrium can be quantified, a technique was proposed, based on a small scalar products computation. It is possible to specify the network homogeneity, and to improve it further on. This homogeneous repartition is very important for orbit determination, but also for general geodetic parameters (pole coordinates, geocenter, reference system). This is one of the reasons why DORIS geocenter is attractive, even if the Satellite Laser Ranging technique is less noisy.

There is another reason to separate the beacons.

Current DORIS receivers are limited to seven beacons simultaneously. For Jason satellites and higher altitudes, visibility circles are large and there may be too many beacon signals received together at the antenna. This is true especially on the dense parts of the DORIS beacon network, for instance over Europe. We should avoid too many beacons in same regions, as it may lead to Radio- Frequency perturbations for the highest receivers.