

Occultation of Betelgeuse by Leona (12 December 2023)

Predictions and last news

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Occultation of Betelgeuse - 12/12/2023

- **An occultation not as easy to predict**

- Betelgeuse (45-55mas)
- Leona (40-55mas)

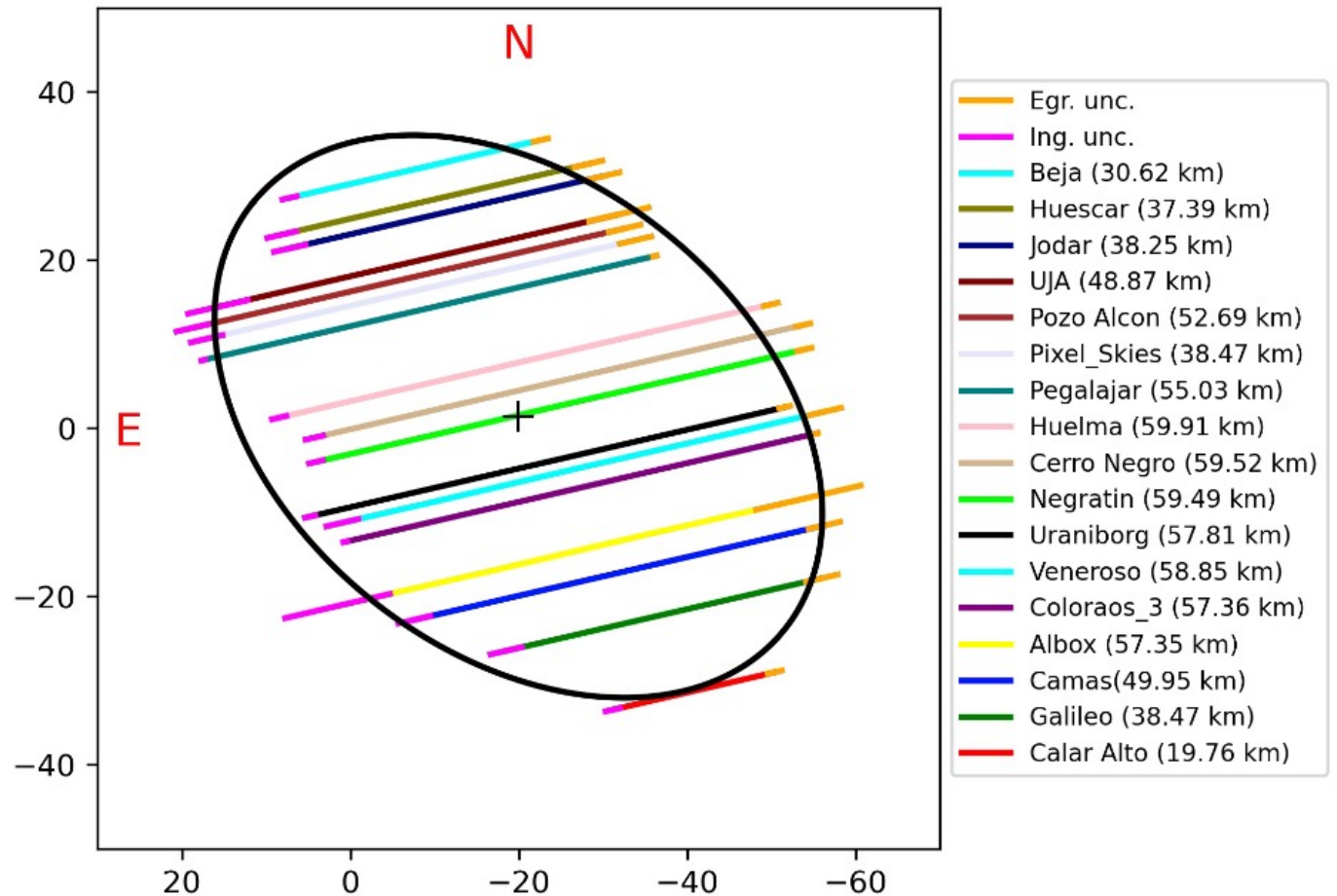
=> more an eclipse/transit of Betelgeuse by Leona

- Betelgeuse astrometry
- Leona orbit

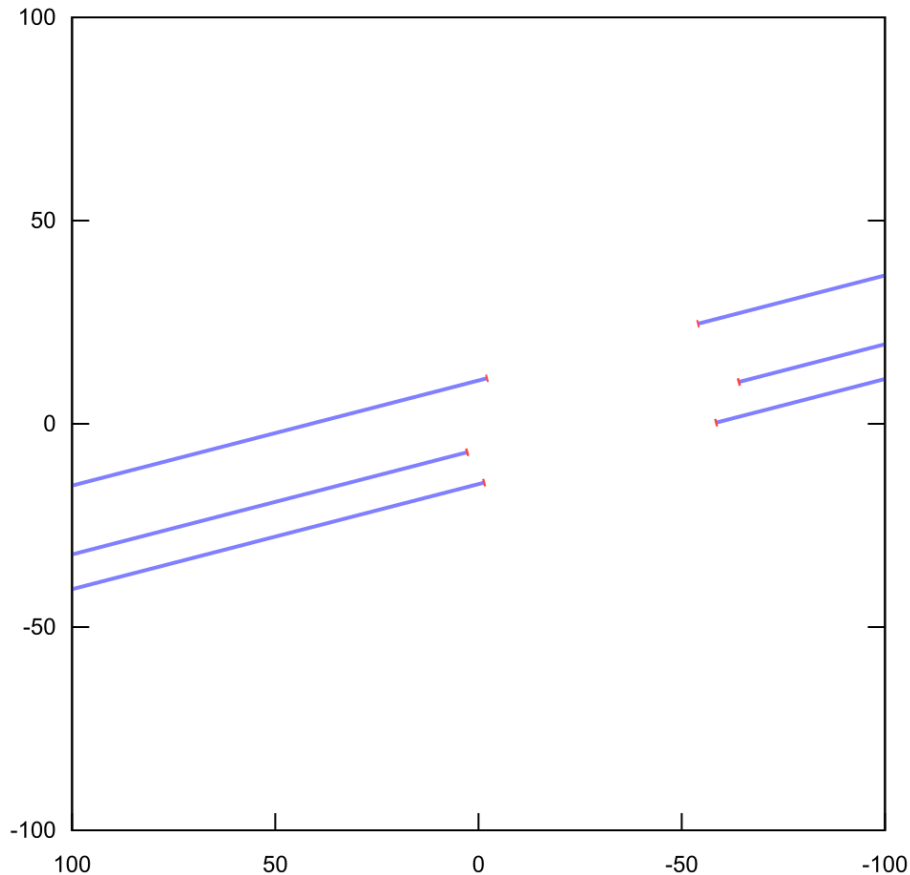


Occultation Leona - 13/09/2023

- Occultation by Leona 13 sept. (17 positives, Spain)
- Leona : 79.6 ± 2.2 km x 54.8 ± 1.3 (Ortiz et al., 2023arXiv)

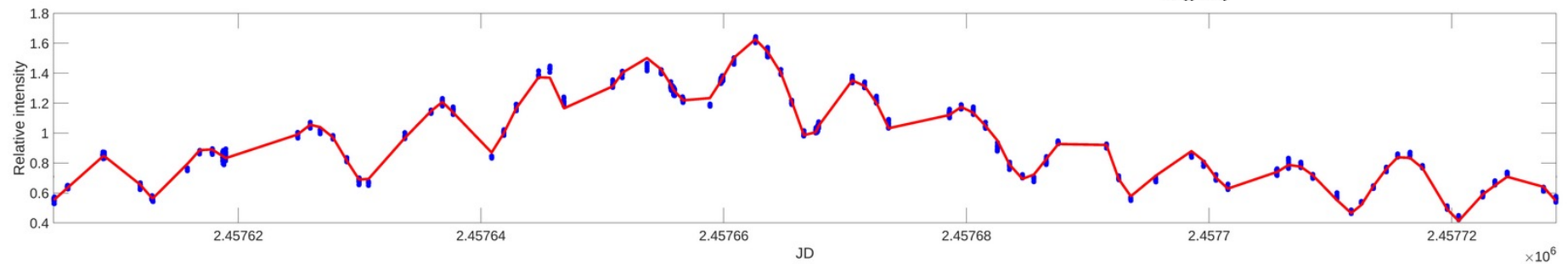
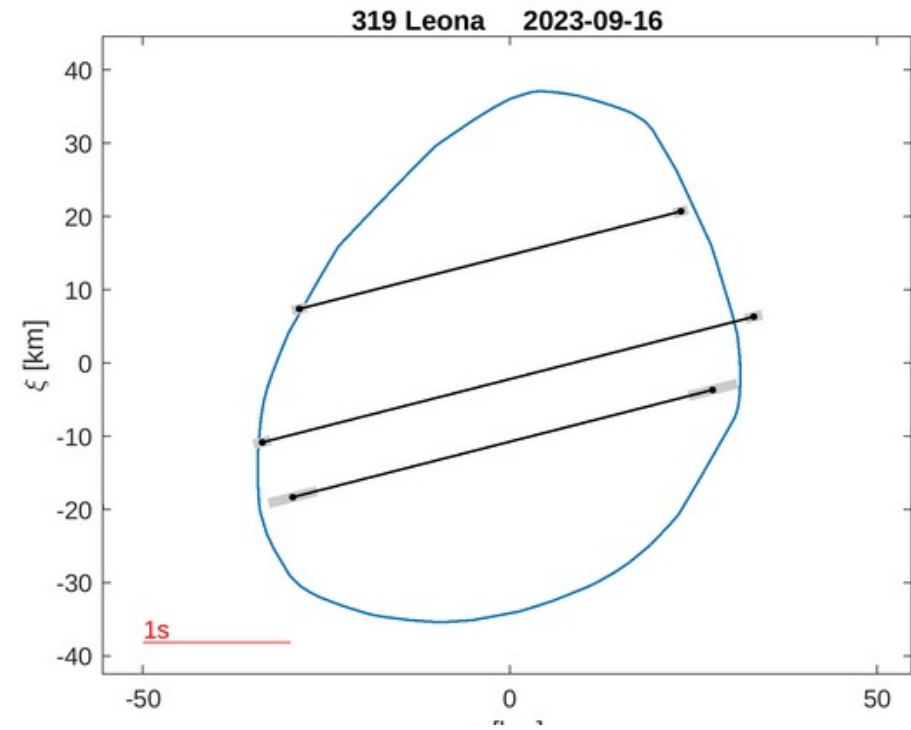
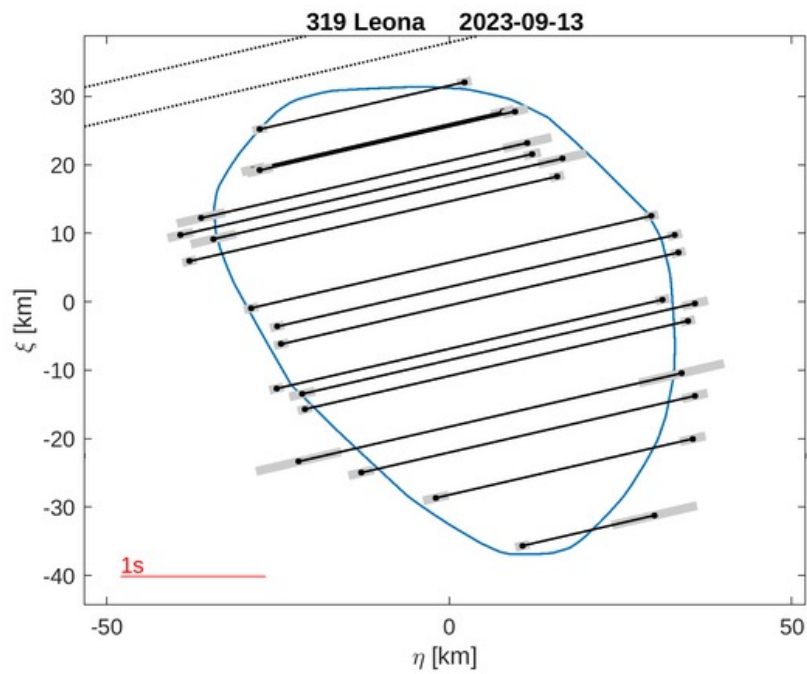


Occultation Leona - 16/09/2023

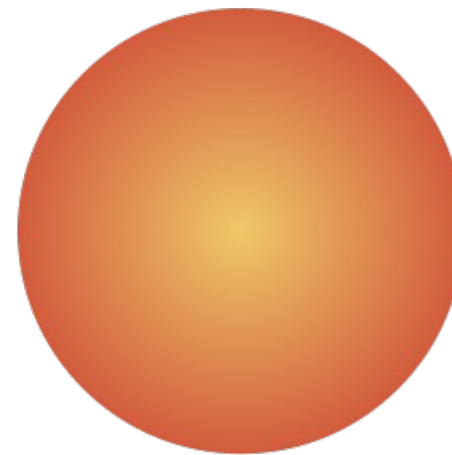
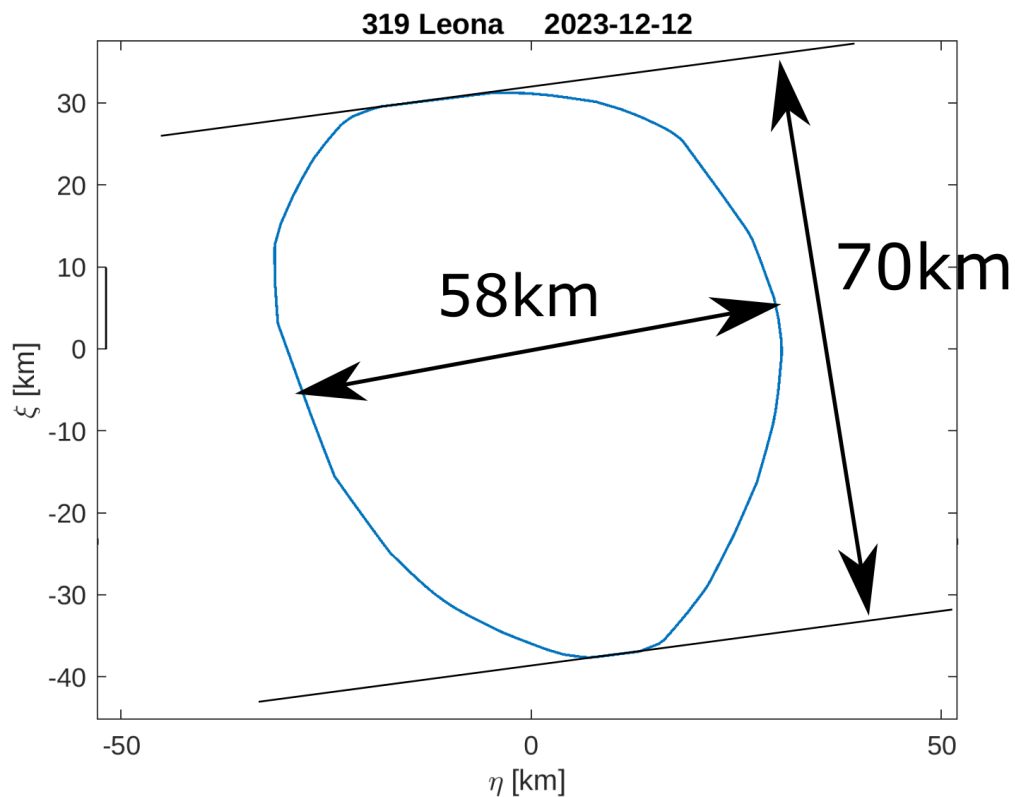


- Occultation by Leona on 16 sept (3 positives, USA)
- Confirmation of ephemeris offset
- Orbit of Leona : ok
- New constraints for the shape and rotation
- Next occultations :
 - 29/10 (Central Europe) -> not observed?
 - 30-31/12 (France, Italy)

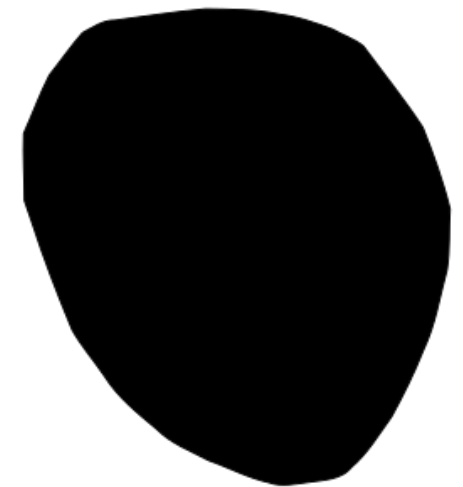
3D shape of Leona (J.Durech, Charles Univ.)



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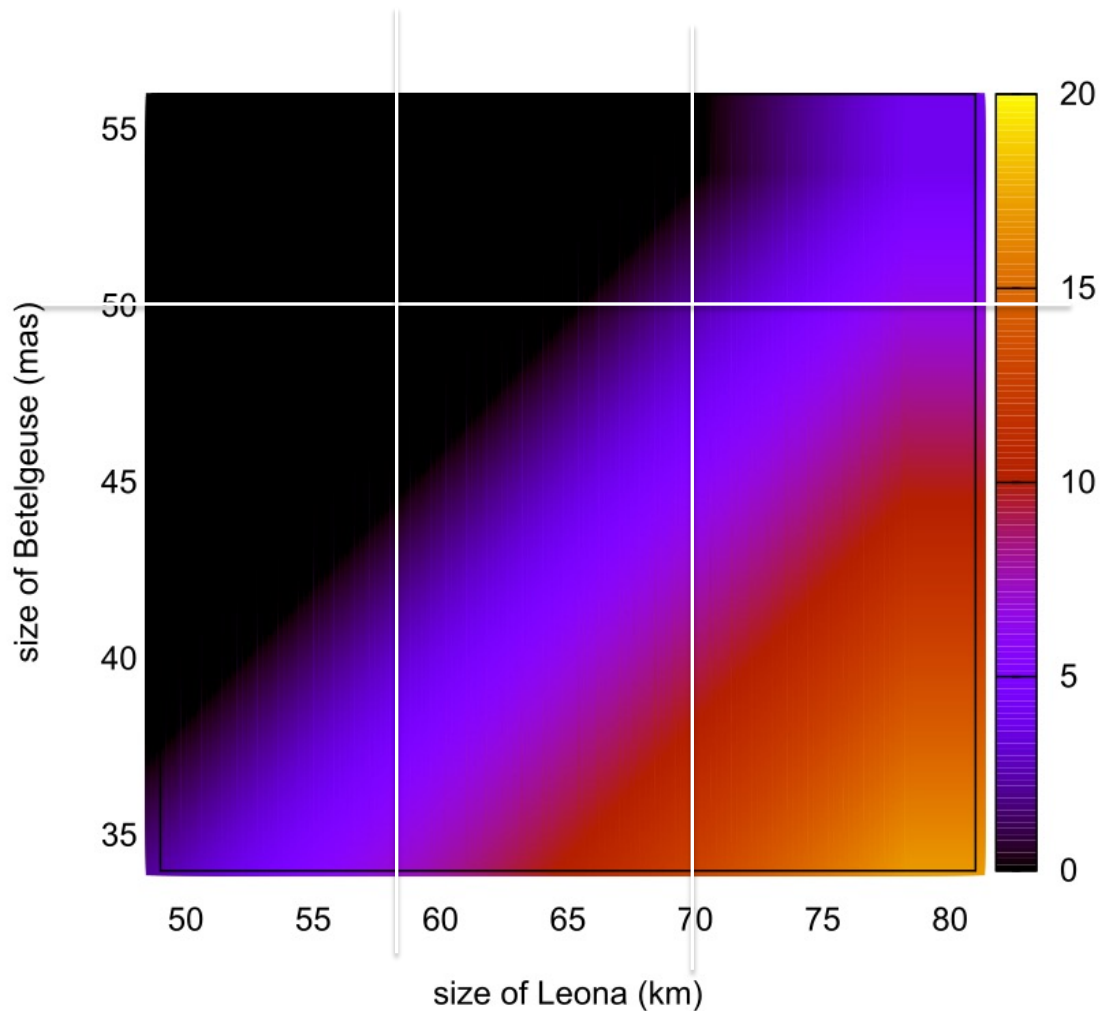


Betelgeuse
50mas



Leona
44 mas x 53 mas

Total or partial ?



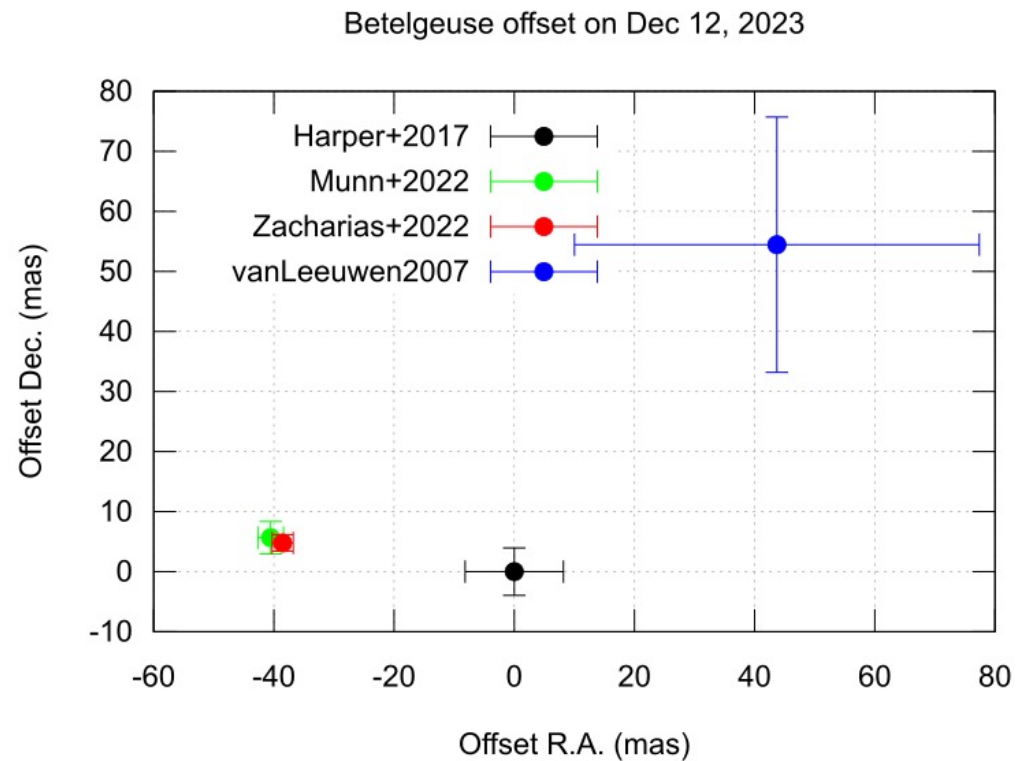
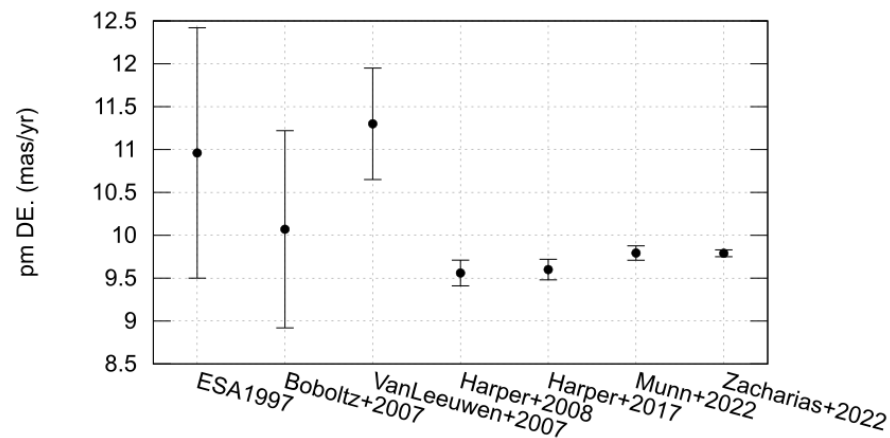
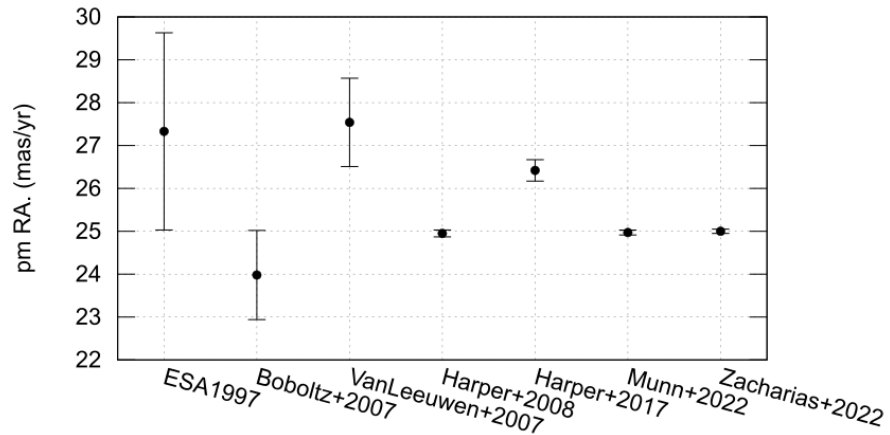
Apparent size of Leona and Betelgeuse are roughly similar (~40-50mas)

With an apparent of 50mas for Betelgeuse and 70km for Leona, the **width of totality is 2.2 km** and **width of partiality is 67.8 km**

But with a size of 58km (44mas), occultation will remain partial

Betelgeuse astrometry

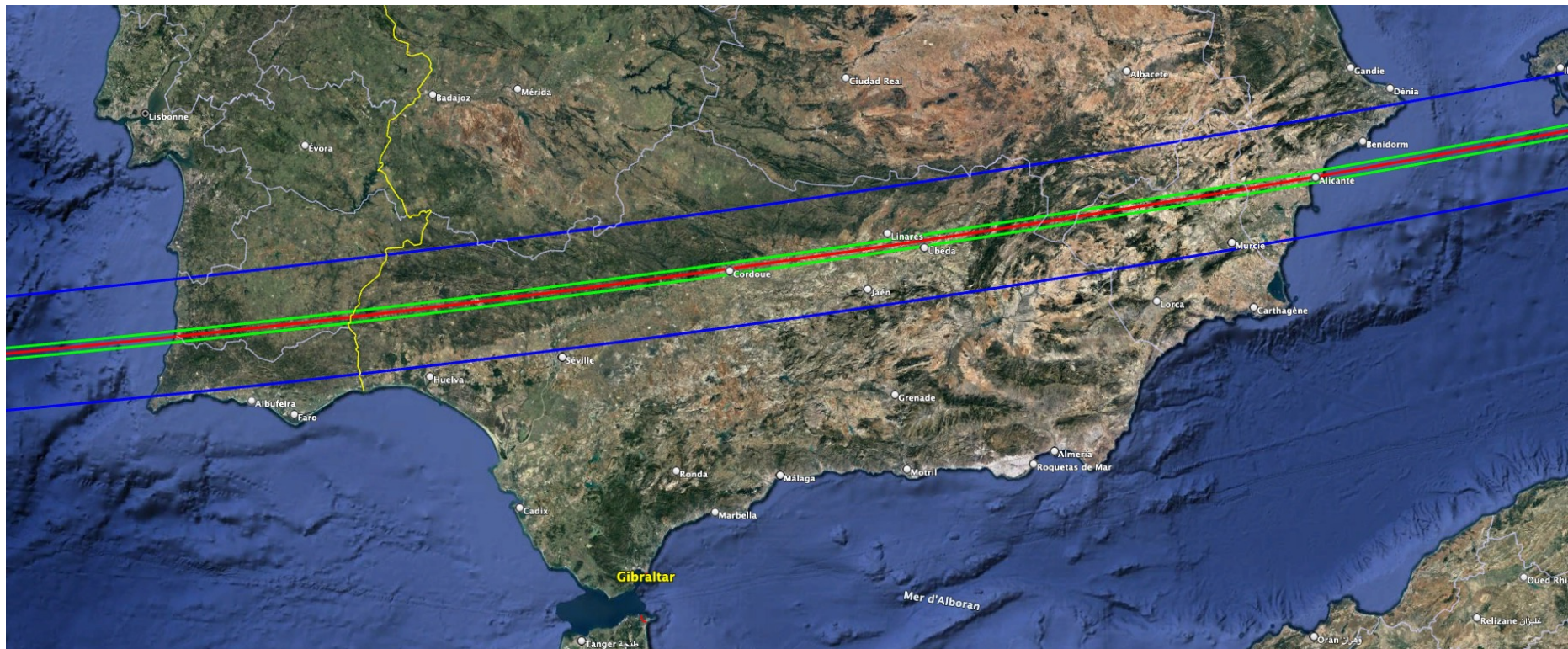
- Betelgeuse astrometry -> not in Gaia -> several astrometric sources



Current prediction

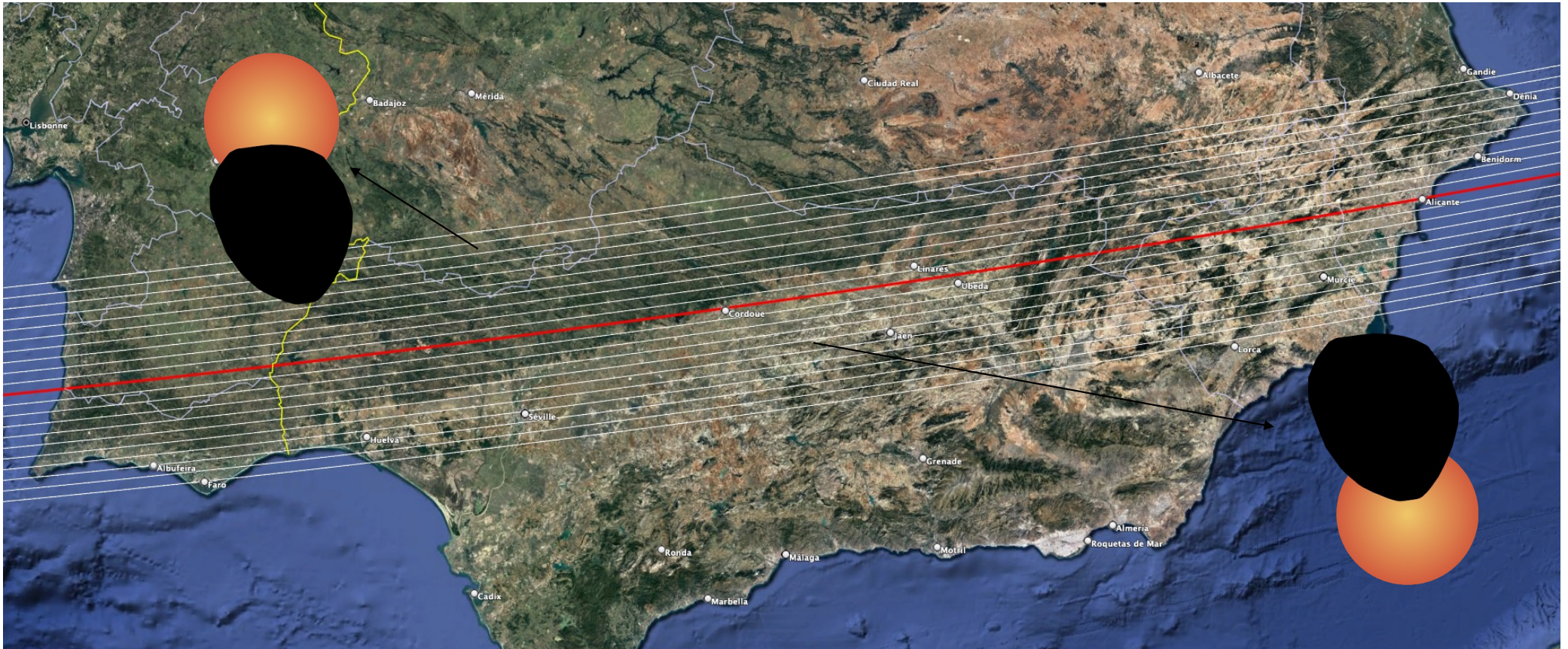
<https://lesia.obspm.fr/lucky-star/occ.php?p=131608> very close to D.Herald (~2km)

Keep in mind, it is a prediction, no one knows if the occultation will be total and if really total, where it will be visible.



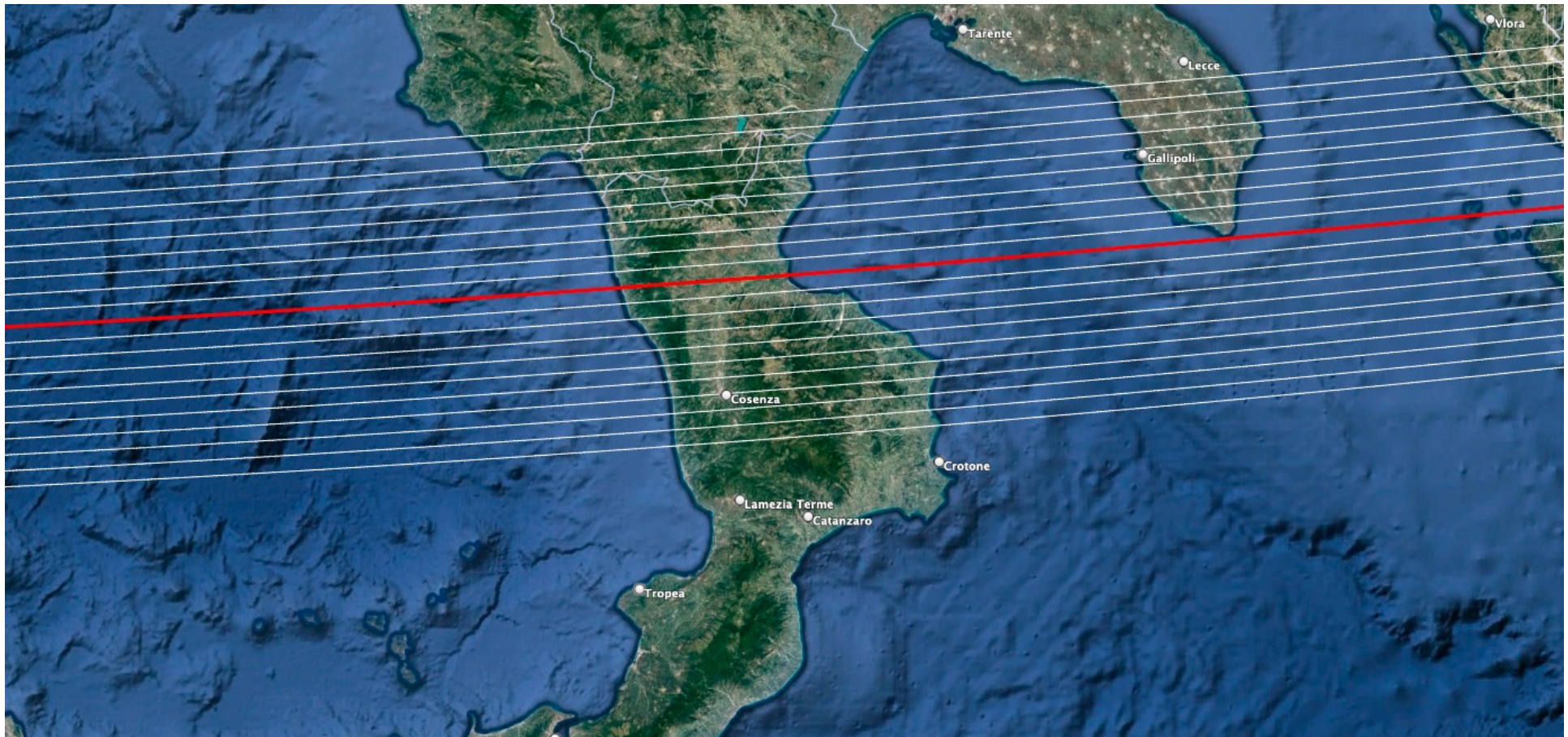
Current prediction

Example of distribution : 20 chords every 5km covering +/-50km (to be defined in the coming weeks)



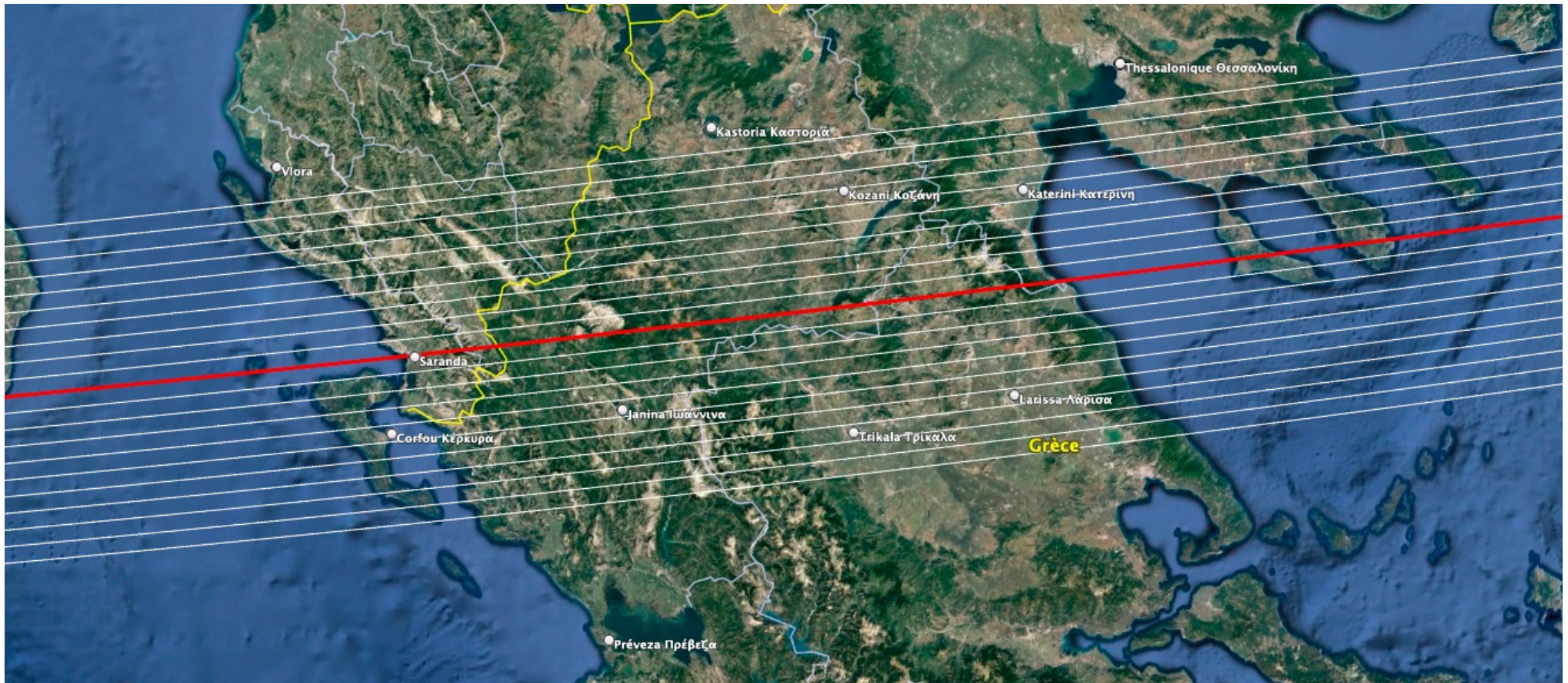
Current prediction

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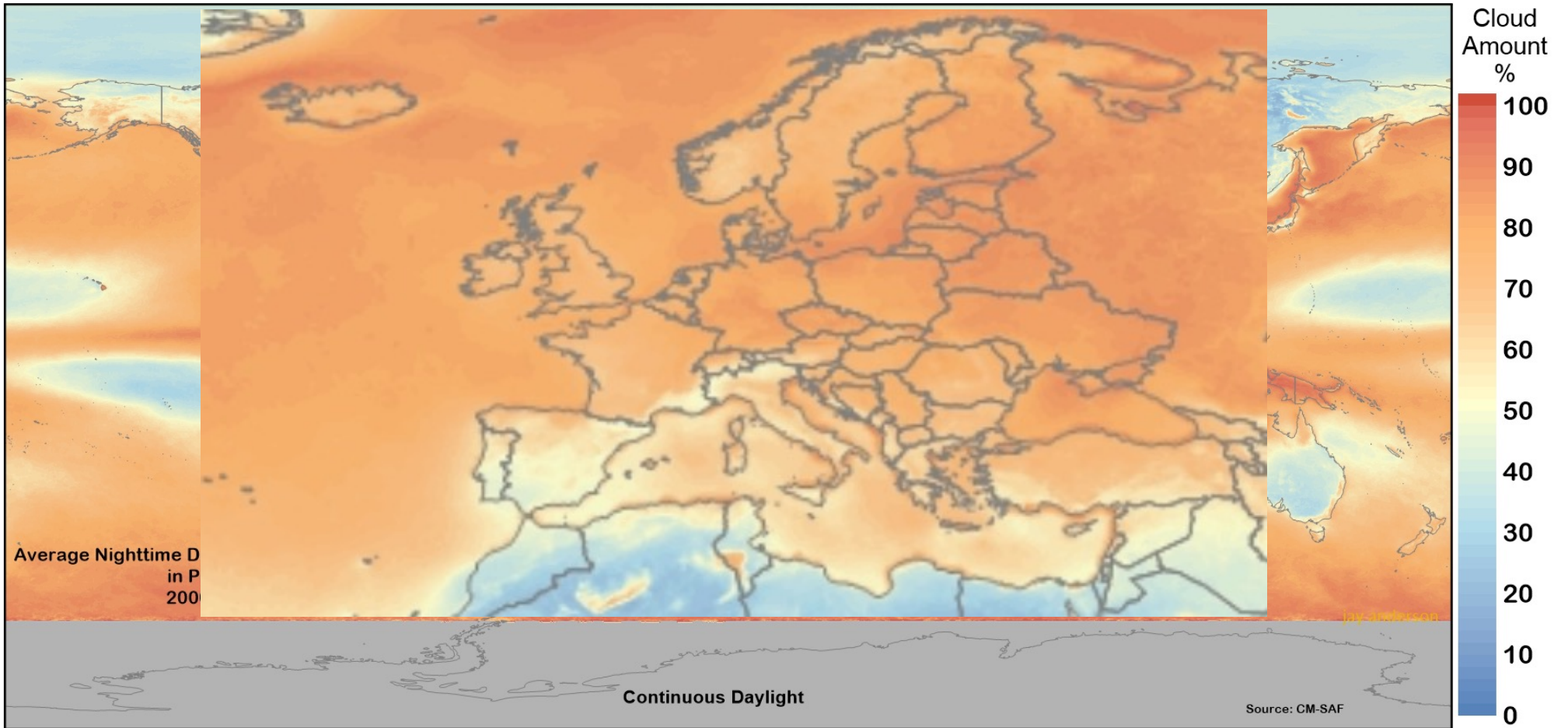


Current prediction

Example of distribution : 20 chords every 5km covering +/-50km (to be defined in the coming weeks)

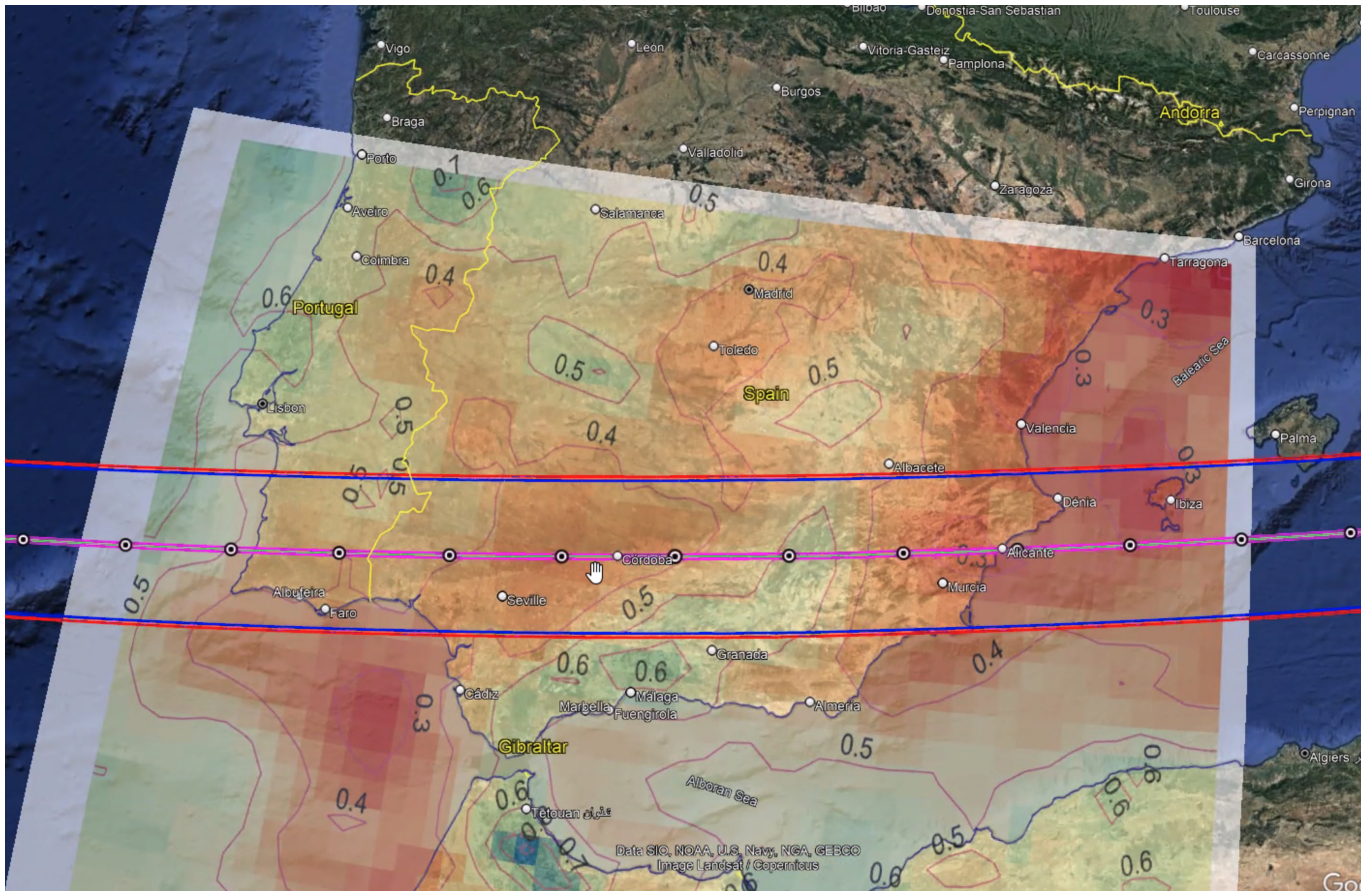


Weather forecast (statistics)



Source : <https://eclipsophile.com>

Weather forecast in Spain (statistics)



Weather statistics over 30 last years the night of 12 December

2 preferred locations:

- Alicante (30% cloud cov.)
- Cordoba/Sevilla (40%)

Source J.L.Ortiz