



Observatori  
de  
l'Ebre

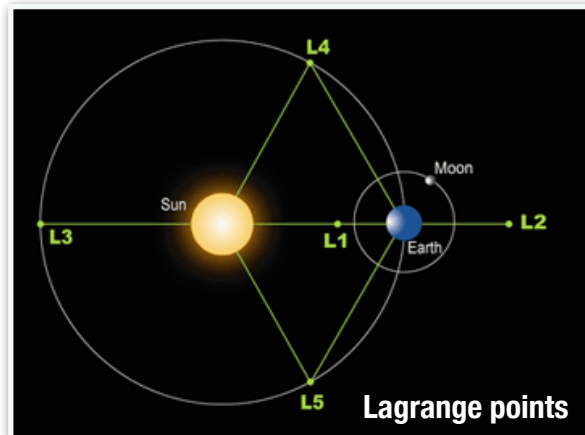


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## Forecasting hazardous geomagnetically induced currents (GICs) for Spanish critical infrastructures

**AIM:** Develop a predictive model of the impact of violent solar storms on Spanish critical infrastructures (such as the power transmission grid, railways, and oil and gas pipelines) → **Benefit: prediction!**



- Input data from the solar wind space probe ([ACE](#) located at L1) to develop a deep learning model taking into account past conditions to predict the variation of the magnetic field on the Earth's surface at different locations in the Iberian Peninsula.
- Feed these local predictions of time-variation of the magnetic field into a physical model of the 3D Earth's geoelectrical structure to generate the geoelectrical fields that drive the GIC.

- **Observatori de l'Ebre:** expertise in Space Weather GIC modelling
- **UB:** expertise in geoelectrical physical modelling
- **IFIC:** expertise in deep learning techniques (recurrent neural networks (RNN), long short-term memory (LSTM), nonlinear autoregressive exogenous model (NARX) or fully convolutional neural networks such as U-Nets) → Keras ([TensorFlow](#) or [PyTorch](#))
- **Support:** advance course on deep learning techniques which use memory of past data will be really appreciated