



PHOEBUS: a proposal for solar physics on LISA

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The Laser Interferometer Space Antenna (LISA) is a joint ESA-NASA mission in space for the detection of gravitational waves. Three pairs of test masses are mounted on three satellites, spread out in space on an equilateral triangle with legs of 5 millions of kilometers. The three spacecraft maintain independent orbits around the Sun. The center of the triangle lies on the ecliptic, 20 degrees behind the Earth. Cosmic rays and SEPs with energies larger than 100 MeV/n are able to penetrate and charge the test masses, generating a noise that can dominate the sensitivity of the interferometer and produce spurious signals able to mimic the gravitational wave passage. Onboard silicon counters will allow us to monitor in real time the effective flux of galactic and solar particles penetrating the test masses. We propose to use these particle detectors to map the transit of CMEs through the LISA spacecraft at various steps in longitude: 20 degrees between Earth and LISA and two degrees among the LISA spacecraft. Hopefully, a comparison will be also carried out with other experiments orbiting the Sun. Under the assumptions listed above, LISA offers a unique chance to study the dynamics of CMEs and Space Weather related problems. Moreover, our contribution to the COSTA 274 on the Physics Of Events Bursted by the Sun (Phoebus, inside WG1/WP13000) will develop appropriate simulations by using space-based data and theoretical models.