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Three dimensional study of Lutetia's fault network

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The Scientific Imaging System for Rosetta, OSIRIS, acquired an imaging sequence of Lutetia allowed the detection of a huge number of lineaments distributed over most of the asteroid surface Thomas et al., 2012, Planet. Space Sci., 66, 96-124; Massironi et al., 2012, Planet. Space Sci., 66, 125-136) . Several categories of features has been observed, like troughs, scarps, faults, and ridges. These lineaments are generally more than 50 km long and 1.2 km in width in places and seem to form systems. Moreover, in the different geomorphological regions of the asteroid, the lineaments show a preferred orientation but in all regions there are lineaments which cross or do not follow the local preferred orientation. Lineaments radial to impact craters as seen on other asteroidal bodies are mostly absent (Thomas et al., 2012, Planet. Space Sci., 66, 96-124).
However, on a non-spherical body it is not obvious to determine the relationship occurring between the different lineaments. Indeed, lineations that appear to be similarly oriented on different asteroid facets could have no correlation at all (Buczkowski et al., 2007, Icarus, 193, 39-52). In this context, the mapping of the lineation on Lutetia shape model allow us to obtain a three-dimensional view of these structures that have been interpolated to define planes cutting through the asteroid. This can give us new clues to understand how these structures formed and if surface lineations are representative of internal asteroid structure, yielding information about the nature and history of Lutetia.