

Positive openness map for visual inspection of fault scarp associated with lunar wrinkle ridges

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Wrinkle ridges are topographic features observed often in plains of the moon. Both edges of wrinkle ridge have scarps related to the fault slip in the subsurface. According to a hypothesis of the origin of wrinkle ridges (e.g., Suppe et al., 1983), the scarps are defined as fore-limb and back-limb, and the fore-limb which has abrupt slope compared with back-limb corresponds to a fault scarp. These fault scarps are formed by horizontal pressure related to tectonic deformation of subsurface of the moon. The spatial distribution and their scale of fault scarps with wrinkle ridges lead us to understand the evolution of the lunar subsurface.

We applied the positive openness as a representative parameter of solid of the sky extent over a point of interest as a parameter for preparing effective data to identify candidates of fault scarps associated with wrinkle ridges. Positive openness map could be calculated from lunar Digital Terrain Model (DTM) acquired by Terrain Camera/Kaguya. Radial limit which is the range of positive openness calculation for the interest, affects the difference in vision of enhancement of topographic features. As a result of several radial limits calculations, we adopted radial limit of 222 m as a most appropriate one. By using of positive openness map, we could found several candidates of fault scarps associated with wrinkle ridges.

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