

Application of JERS-1/In-SAR for Afar: Crustal deformation around Manda - Inakir and Asal - Ghoubbet rift zones

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Afar is the triple junction area between Arabia, Somalia and Nubian plates, and is one of the major rift zones recognized on the ground. The crustal deformation of Afar has been deduced from geomagnetism, geology and seismology by many scientists. For more details, the current crustal deformation must be detected by geodetic measurements. From the recent years, the crustal deformation in Iceland where one of the rift zone recognized on ground has been measured using GPS and SAR interferometry, however only few attempts have so far been made at that in Afar. In the previous study, we attempted to detect the crustal deformation in Southeastern Afar using SAR interferometry. However we could not process the interferometric SAR image accurately, because the most of processed SAR scene area was deformed. For more accurate processing, we should apply SAR interferometry to the wider area, which includes the inactive crustal deformation area. In this study, we apply SAR interferometry to the west and south SAR scene from that used in the previous study.

In the previous study, we found the crustal deformation of uplift sense in the east end of Manda - Inakir rift zone, and that of subsidence sense outside uplift sense area with about 20 km width. The width of this crustal deformation structure was narrowed with approaching to the Asal - Ghoubbet rift zone as V-shape. We found the same V-shape structure in the west of Asal - Ghoubbet rift zone in this study. This V-shape may influence relations of opening rate between the Asal - Ghoubbet and Manda - Inakir rift zones. However it is possible that this V-shape structure is caused by errors for the tropospheric delay and/or the inaccurate digital elevation model. Then this V-shape structure must be carefully discussed using more accurate crustal deformation field detected from more interferometric SAR images, and we have just processed.