Elevation Value Enhancement on Digital Elevation Model with Combined Ascending and Descending SAR Data

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SUMMARY

The accuracy of the Digital Elevation Models derived from Synthetic Aperture Radar satellites depends on many factors. The resolution of the satellite, the type of the work area, the structural properties of the work area, the software used for the application, the base distance of satellite and the coherence value of the images etc. directly affect the accuracy of model. If The working area is very flat and the slope value is smooth ensures that the accuracy is high. Contrast of this, high accuracy can not be mentioned in the digital elevation model obtained from sharp transition and high slope area. The reason for this is explained as the geometry of the SAR satellite image recording.

Two different SAR satellites are mentioned as descending orbiting satellites and ascending orbiting satellites. Depending on the inclination of the mountains, sometimes the descending satellites, sometimes ascending satellites, may be subject to shadow effects. It is not possible to leave shadowed areas blank while generating the digital elevation model. For this reason, the shaded regions are given an approximate value by applying various interpolation methods.

With combined use of descending and ascending satellite images, it brings more accuracy to the shadowed areas. For a mountain, the use of ascending satellite data to complete the shaded areas of descending satellite data reveals more realistic results.

The aim of this study is to reduce the effect of shadow error, which is one of the biggest problems for radar data, at Digital Elevation Model. For this aim, the improvement of the areas with shading in the descending satellite data is done with the aid of the ascending satellite data, the Digital Elevation Model accuracy is increased. In this study; Hasan Mountain (3268 m), which is located in Aksaray and Niğde districts, has been evaluated in digital elevation model obtained from

Sentinel-1A Interferometric Wide Swath (IWS Mode) imaging type.