

Precise determination of grounding line using ERS-1/2 InSAR

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Grounding line is a marginal zone between continental ice sheet and ice shelf and it is very important to understand its position and detail shapes precisely from the geographical and geophysical point of view. However, it is very difficult to estimate grounding line by in-situ observation due to severe weather condition of polar region. In this study, we extracted precise position and shapes of grounding line at broad region along with Antarctic continent to use ERS-1/2 InSAR tandem data analysis. Grounding line is represented as a concentrated interferometric fringe between fixed ice sheet (in the short term) and moving ice shelf due to ocean tide.

Study areas are 25deg.W - 40deg.E on East Antarctica and 85deg.W - 165deg.W on West Antarctica. The numbers of SAR data are approximately 130 pair of scenes on 64 paths. Extracted grounding lines from InSAR analysis were compared with conventional grounding line data stored in Antarctic Digital Database (ADD). ADD is a digital geographical database compiled by British Antarctic Survey (BAS). ADD included almost all kind of geographical information collected by various countries in their Antarctic research activities. The result of comparison showed the uncertainty of grounding line information of ADD which has pointed out by Ozawa et. al (2002). We concluded that this uncertainty was caused by uncertainty in grounding line interpretation using Landsat optical satellite data and inaccurate geographical information which compiled in the ADD.