

## **ERS Interferometry Studies of Antarctic Ice Shelves**

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### **Abstract**

**ERS radar images of the Hemmen Ice Rise and of Lassiter Coast, the two corner points of the Ronne Ice Shelf, Antarctica are utilized to study the ice flow dynamics of the ice front of the Ronne Ice Shelf where it is torn apart to form large, tabular icebergs. A modelling approach combining a finite element analysis and the ERS interferograms are utilized to constrain and better understand the mechanics of formation and evolution of the rift zones. The ERS interferograms provide information on ice velocity, grounding zone, tidal amplitude of ocean forcing, and scale, geometry and structure of the cracks initiating ice-shelf rupture. The model/ERS comparison is the first attempt at comparing actual deformation rates of an ice shelf measured by a satellite instrument with deformation rates predicted from a model. The preliminary results indicate that the model can replicate the patterns of surface deformation recorded by ERS very well, although local differences do exist. The model/ERS fringe comparison provides useful hints about the cycle of ice-shelf boundary rupture/annealing. It is speculated from this analysis that the pinning points of the ice shelf restrict the length scale and propagation of ice-shelf rifts progenitors of the largest bergs and help stabilize its calving front.**

*Keywords: Interferometry, glaciology, modelling*