



Iceberg generated tremor in the vicinity of South Georgia Island

D. Jansen (1), C. Müller (2)

(1) Alfred Wegener Institute for Polar and Marine Research
Bremerhaven(daniela.jansen@awi.de), (2) FIELAX Gesellschaft für wissenschaftliche
Datenverarbeitung mbH

We evaluated the seismic records from HOPE Station (King Edward Point, South Georgia Island) for two time periods in which four large Antarctic icebergs reached the island: 1 December 2002 to 31 March 2003 and 1 December 2003 to 29 January 2004. The iceberg movement and small scale drift patterns including rotation were monitored on a day to day basis using MODIS imagery. During the observation periods several seismic tremor events occurred, which could be assigned to the icebergs by 2-D particle motion analysis. Two key events are described and analysed in this study: 1: Harmonic tremor occurred when A-43G, a Ronne Ice Shelf iceberg containing a major rift structure, was caught in an eddy at the Southern Antarctic Circumpolar Current Front (SACCF) in the north west of South Georgia. The signal started with the rotation of the iceberg and is dependent on the position of the rift relative to the current. 2: The iceberg A-38B caused a high energy tremor with diffuse spectral features when it first collided with the steeply rising sea floor near to the coast of South Georgia Island. Five days later the iceberg finally grounded, the scraping over the seafloor caused a likewise diffuse tremor lasting for 2 days until the iceberg reached its final position. We found that the harmonic tremor events are only caused by iceberg A-43G, which had large geometric anomaly in form of a rift, and only if the rift opening is at a certain angle to the surrounding ocean current.