



COLD MAGICS – Continuous Local Deformation Monitoring of an Arctic Geodetic Fundamental Station

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In the summer of 2009 we performed the COLD MAGICS project at the Geodetic Observatory at Ny-Ålesund. The goal of this ARCFAC sponsored project was to install a continuous local deformation monitoring system at a geodetic fundamental station in a harsh arctic environment with permafrost conditions. The plan was to involve as many as possible of the existing geodetic and geophysical sensors in a continuous and automated survey with high temporal resolution and sub-mm accuracy. The project duration was 10 days and resulted in interesting results that indicate short term differential movements of order 1 mm or more between the foundations of different space geodesy techniques. During the campaign the weather was very stable with a period of more than 100 consecutive solar hours. This period stands out in our time series and indicates a diurnal deformation effect of the space geodetic instrumentation that we did not anticipate. The results indicate local movements that probably are not restricted to the arctic, and hence the monitoring system would be applicable to geodetic fundamental stations in any environment.