



Influence of Baroclinic flow on Induced-Voltage Measurements

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Data from a cable-based observational system, capable of providing lowest-order measurements of barotropic flow, were compared to predictions from a 3D ocean circulation model for the Baltic Sea. The Rossby Centre Ocean model (RCO) model was developed by SMHI and employed in this study. The transport across the Västervik-Visby transect in the Baltic Proper was examined during a Winter and a Summer period, for both of which the flow was separated into barotropic and baroclinic compounds. Time-dependent indices were formulated to describe the fractional influence of barotropicity and baroclinicity on the net flow. The possible baroclinic influence on the geo-electric measurements were examined and qualitatively estimated using a simple two-layer electric model. Data sets from tidal-gauges, located in the south-western Swedish coastal area, were used as an approximation for barotropic flow, hence making interpretation of the motionally-induced voltage measurements possible without taking recourse to the ocean model.