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HF radar measurements of surface currents in the Northwestern Mediterranean Sea: first results

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An experiment is being performed from June 2005 over the eastern part of the Gulf of Lyons (Northwestern Mediterranean) consisting in continuous surface current measurements using a FMCW HF ground- wave radar system (WERA) at a resolution of few kilometers and a sampling rate of 30mn. The overall purpose of the experiment is to collect an extensive data set spanning over one year for dynamical process studies and assessement of physical models.

The radar system and signal processing methods are presented. These methods include two dedicated softwares which were developed to reduce radiowave interferences and to optimize the measurements for one of the radar station whose receiving antennas consist, due to logistical constraints, of a linear array of only four antennas (MUSIC algorithm).

Preliminary results are given emphasizing:

- the statistical properties of the current field in the area using classical data processing methods: rotatory analysis, EOF, time-frequency analysis

- the detection of the North Current flowing along the shelf break from the Ligurian basin, north-east of the Northwestern Mediterranean, to the Spanish coasts, and its time and space variability properties

- the surface current signature of special meteorological events often encountered in the region

- some comparisons with modeling results performed using the 3-D hydrodynamical model MARS (Model for Applications at Regional Scale) of Ifremer (Institut Français

de Recherche pour l’Exploitation de la Mer).