



Potential Use of HF Radar for Tsunami Detection in the Central and Eastern Mediterranean

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Today, HF radar is recognized as internationally cost-effective and efficient solution to provide near-real time measurements that cover a large area continuously over time for ocean hazards warning and long term ocean monitoring studies such as, seasonal forecasts of climate, hurricanes, storm surges and large-scale ocean circulation changes. These radar systems recently became an operational tool in coastal monitoring worldwide. They are used for many operational applications that include ship detection, tracking, guidance, distribution of pollutants, fishery and oceanography. HF radar data used for the tsunami warnings, can also be used for the other purposes and be of potential interest to wide application area users and stakeholders. Moreover multi user applications will ensure the system is maintained operationally over the long term. Hence the system is cost effective also with regards to maintenance. New algorithms allow useful detection and verification for tsunami detection. While technical monitoring capacity and the algorithms for tsunami detection is improved significantly, further studies are required to obtain complete wave height determination.

We analysed the available technology and algorithms for the purpose of tsunami detection in the central-eastern Mediterranean and its connected Seas (Aegean and Black Sea). Since the study area is characterized by narrow continental shelf area, the HF radar observation for the purpose of tsunami detection is possible in restricted areas. While extensive continental shelves in the northeastern Black Sea and along the coast of Tunisia in the central Mediterranean let tsunami detection 2.5 hours before tsunami waves hit the coast, the detection is possible around 1 hr or less in advance for the remaining basins with wide continental shelf areas. The bathymetric structure is important for deciding the applicability of HF radar systems for the tsunami detection in continental shelf areas, which can be covered by medium range radars (75 - 100km). The steep continental shelf slope areas are suitable for providing an advance warning for tsunami. On the other hand, areas deepening sharply close to shoreline would not be suitable for providing advance tsunami warning by using HF radar.