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Dynamic routing communications in a spatially distributed ocean observing system

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The most effective way to observe a spatially extended system like the ocean is through a network of distributed platforms and sensors. Networking underlies most of present ocean observatories. Communications to transmit data from the nodes to the onshore laboratory usually involves satellite links, increasing the costs of operation. Implementation of routing network technology could provide high transmission rates of data at very low cost.
A procedure and associate software has been developed to cascade the measurements from the most offshore nodes of the observing system to a central node located at land. The working procedure is the following: the central node explores the connectivity of the network of sensors trying first to access directly to all the nodes. Messages to the nodes with no direct link to the central node are routed trough the visible nodes. The outcome of this process is a connectivity graph linking all nodes of the network with the central node. Once this is achieved, a probability of access criterion selects the best communication path for each node. The configuration is dynamic in the sense that if a node is lost, the network is automatically reconfigured finding a new connectivity graph.
The proposed procedure has been physically implemented using a set of four spatially distributed moorings. Each mooring was constituted by a buoy including a temperature sensor and a radio communication link. Results obtained from measurements are shown for different spatial mooring distributions.