332

PROFILING FLOATS UNDER SEA ICE IN THE WEDDELL SEA

O Klatt, O Boebel, E Fahrbach

Alfred Wegner Institut for Polar and Marine Research, Bremerhaven, Germany

The ARGO system is expected to form the backbone of a global ocean observing system. Its extension into the ice-covered polar oceans is difficult, since current profiling float designs have to return to the sea surface to be located and to transmit their data record. Since 1999 autonomous, profiling floats were deployed in the Weddell gyre area by the AWI-Bremerhaven, many of which failed when encountering sea-ice. This study presents results from recent float developments aimed to overcome these difficulties through ice-sensing, acoustic positioning, and intermediate data storage.

Since 1999 92 autonomous, profiling floats were deployed in the Weddell gyre area. Since 2002, AWI floats feature an Ice Sensing Algorithm (ISA), which determines the likeliness of ice coverage based on upper ocean temperatures. By the end of 2004, 12 of 18 floats resurfaced after the first winter season. All of those surviving the first winter survived the second winter season as well. Thus, the overall probability of ISA equipped floats to endure the winter season is about 80% (24 of 30 instruments). A total of 20 floats are equipped with RAFOS receivers. Sound coverage for the RAFOS navigation system is provided by 3 sound sources installed since 2003 (2 refurbished in 2005) and 3 sources installed in 2005. Sound coverage varies according to season, location and sound source manufacturer, though a value of 400 km can be safely assumed for planning purposes. The intermediate data storage (iStore) technology saves profiles which could not be transmitted in real time due to ice-coverage to be transmitted at a later time. First iStored profiles are expected for February 2005.