

基于 Sentinel-1 数据的阿蒙森海雪龙号航道冰山识别

北京时间 2019 年 1 月 19 日 10 时 47 分，执行第 35 次南极考察任务的雪龙号在阿蒙森海密集冰区航行，因受浓雾影响，在南纬 $69^{\circ}59.9'$ ，西经 $94^{\circ}04.2'$ 碰撞冰山。同日 10 时 41 分 Sentinel-1 获取了该区域的一景 HH 极化、像素分辨率 40m 的 SAR 影像。研究目标是评估 Sentinel-1 SAR 数据用于识别冰山的潜力，尤其是撞击雪龙号的冰山能否被检测从而提前发出预警。除 Sentinel-1 数据外，研究数据还包括船舶自动识别系统提供的雪龙号位置信息。首先根据 AIS 数据识别雪龙号，然后在雪龙号附近建立研究区域，遴选 CFAR 检测算法以自动识别冰山，最后结合目视解译分析结果，以确定利用 Sentinel-1 数据能否识别撞击雪龙号的冰山，以及该数据能识别最小尺寸的冰山。

Icebergs Recognition for Xuelong Ship Channel in Amundsen Sea

Using Sentinel-1 Data

At 10:47 on January 19, 2019(Beijing time), the Xuelong ship, which carried out the 35th Antarctic survey mission, sailed in the dense ice area of the Amundsen Sea. Due to the influence of dense fog, Xuelong collided with the iceberg at $69^{\circ}59.9'$ south latitude and $94^{\circ}04.2'$ west longitude. A SAR image covering the same area was acquired by Sentinel-1 with HH polarization and pixel resolution of 40m at 10:41 on the same day. The research objective is to evaluate the potential of Sentinel-1 SAR images to identify icebergs, especially whether the icebergs that hit the Xuelong can be detected to issue early warnings in advance. In addition to the Sentinel-1 data, the research data also includes the location information of the Xuelong provided by the ship's automatic identification system. First the Xuelong ship is detected according to AIS data. Then area of interest around the ship in the image is cropped. CFAR algorithm fit for iceberg detection is select to automatically identify the iceberg. Finally by the visual interpretation, the result is to determine whether the iceberg hitting Xuelong ship can be detected using Sentinel-1 data and the smallest size iceberg.