Landfast ice zoning from SAR imagery

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Landfast sea ice is a dominant sea ice feature of the Arctic coastal region. As a part of Arctic sea ice cover, landfast ice is an important part of coastal ecosystem, it provides functions as a climate regulator and platform for human activity. Recent changes in sea ice conditions in the Arctic have also affected landfast ice regime. At the same time, industrial interest in the Arctic shelf seas continue to increase. Knowledge on local landfast ice conditions are required to ensure safety of on ice operations and accurate forecasting. In order to obtain a comprehensive information on landfast ice state we use a time series of wide swath SAR imagery. An automatic sea ice tracking algorithm was applied to the sequential SAR images during the development stage of landfast ice cover. The analysis of resultant time series of sea ice drift allows to classify homogeneous sea ice drift fields and timing of their attachment to the landfast ice. In addition, the drift data allows to locate areas of formation of grounded sea ice accumulation called stamukha. This information can be useful for local landfast ice stability assessment. The study is supported by the Russian Foundation for Basic Research (RFBR) grant 19-35-60033.