

## Design and demonstration of an HTS degaussing system

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Ships (made from magnetic materials) travelling through the geomagnetic field have a local influence on the magnetic field. The local disturbances in the magnetic field can be noticed using both active (drones with magnetic field sensors) and passive (magnetic mines) methods. A degaussing system consist of a set of coils, that can be used on to reduce the magnetic signature of naval vessels. To reduce the magnetic signature of large naval vessels, currents up to 1 or 2 kA turns have to be used. In conventional degaussing coils, these currents produce large ohmic losses that are dissipated as heat. These losses can be significantly reduced by applying superconductive coils that have (near) zero resistance and consequently hardly to no ohmic losses. The aim of this study is to decrease the power usage of conventional degaussing systems using high temperature superconductors. HTS cables constructed using YBCO tape and cooled using subcooled liquid nitrogen will be used. A demonstration of an HTS degaussing system is planned for the beginning of 2020. This demonstration will include two sets of 3 degaussing coils, one set of copper coils and one set of HTS coils. The HTS coils will be compared to the copper coils and the performance of the system will be evaluated. The design of the system and the cooling strategy is presented.