

# thinfilms and NEW IDEAS for SRF

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## Measuring field penetration on thin film Samples above 150 mT

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Developing thin films deposited with complex superconductors like Nb<sub>3</sub>Sn or multilayers requires being able to test the maximum field achievable on numerous samples. In classical magnetometer where the sample is immersed in homogenous field, there is always some ambiguity resulting from the fact that the penetration of field can start on the back or the edges of the samples.

We have tried to develop a local magnetometer where the coil is much smaller than the sample such that the sample can be considered as an infinite plane and the transition field can be measured in conditions close to cavity operation. Nevertheless at high field, holding the infinite plane approximation required to have very large samples.

By developing an insert of an insulating, cryogenic effective ferrite, we were able to reach fields the order of 150 mT at 2 K, with field so localized, it become possible to use smaller samples. In principle, the magnetometer can produce by design fields higher than 200 mT, 2K, but we were not able to fully test it yet by lack of the appropriate high performance sample.

With this available tool at our disposal, we can now measure not only thin film samples but also a variety of bulk samples, since the measurement inform us about the field penetration but also about the pinning behavior of the samples, and can thus provide hints about the defect content of the samples. Some examples of such measurements will be shown.

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