

# Critical current evaluation of Nb<sub>3</sub>Sn samples from m(B) curves by SEM image processing in ANSYS APDL using Space Claim import tools

Thursday 4 May 2023 14:30 (30 minutes)

In the framework of the studies on high field magnets for future accelerators, a specific project called AS-TRACT, involving INFN, CNR/SPIN, ENEA and the University of Genoa, is focused on the effect of transverse strain on the critical current of Nb<sub>3</sub>Sn wires. The first phase of the project concerns the effects of strain imposed on Nb<sub>3</sub>Sn wires before heat treatment and the development of a procedure to compare direct critical current measurements with the values extracted by magnetization cycles. At this purpose we developed a protocol that starts from a SEM image and load it in the Space Claim suite, thanks to a CAD file format. Then the image can be converted in Ansys Neutral File and imported in ANSYS Mechanical APDL. By this way we can perform numerical integration over any bundle surface to calculate the magnetic moment shape factor useful to extract the critical current value from magnetization curves. Furthermore, this technique can lead straightforward to 2D or 3D strand models to realize mechanical or electromagnetic simulations.

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**Session Classification:** Electro-magnetic modelling - 2