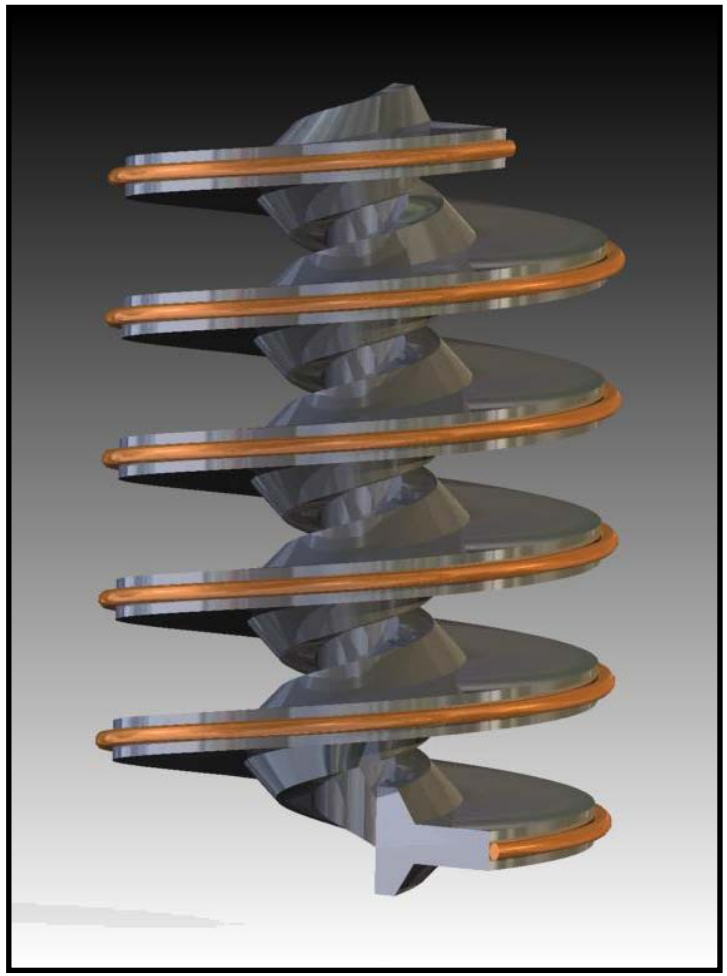
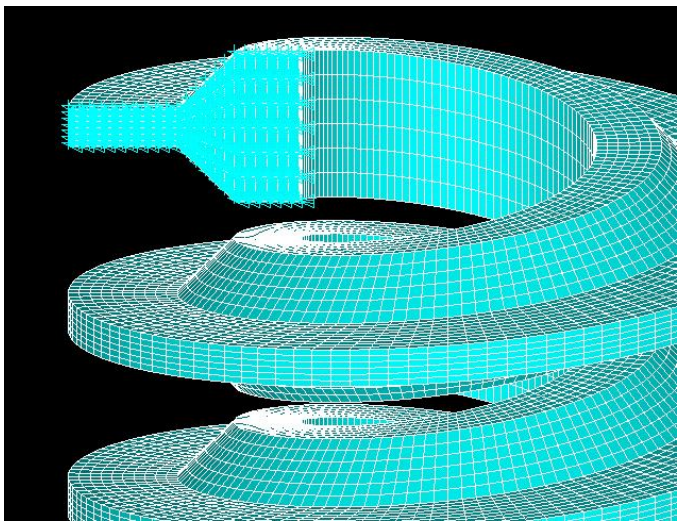
Instrumentation for Measurement of Strain Dependence of Nb_3Sn Conductors

National High Magnetic Field Laboratory

Magnet Science and Technology, Florida State University

An NHMFL User Collaboration Grants Program (UCGP) award is supporting students from the FAMU-FSU College of Engineering as part of a BS-MS program. Part of the purpose of the award is to provide instrumentation for the measurement of strain dependence of Nb_3Sn conductors such as will be used in the Series Connected Hybrid magnet. Specifically, a Walters spring strain probe is being designed. Part of the design is a detailed Finite Element Analysis of the helical spring.





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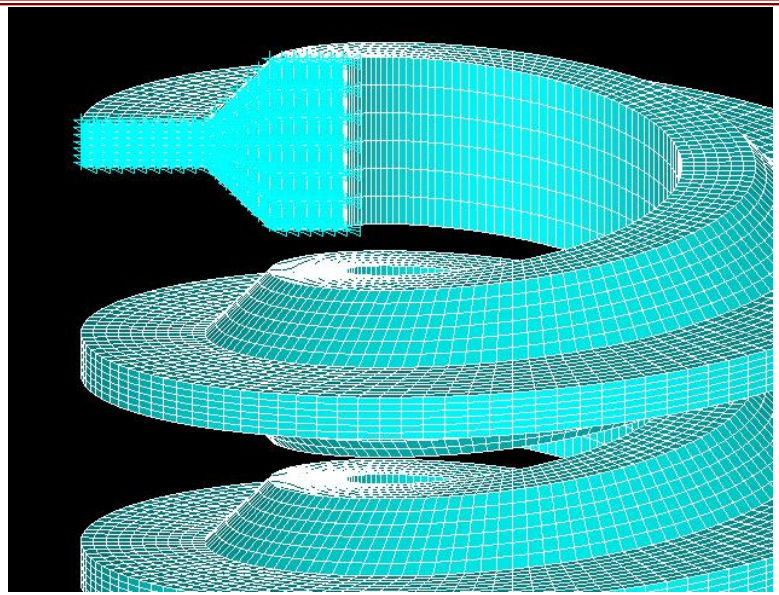

Adam Voran

Jonathan Outlaw

Students **Adam Voran** (2007-2008) and **Jonathan Outlaw** (2008-2009), both of whom are majors in Mechanical Engineering at the FAMU-FSU College of Engineering, have responsibility for the analysis of the Walters spring strain probe.

This has provided them the opportunity for in-depth experience with the Finite Element Analysis program ANSYS, as it is applied to a real technical problem. Both students work closely with the staff and faculty of the Magnet Science and Technology group.

The analysis by Voran has yielded new insights into the mechanics of the helical spring. Outlaw has continued the work with an emphasis on plasticity and thermal effects.