

## **ADTF Spoke Cavity Cryomodule Concept**

**P. Kelley, Los Alamos National Laboratory**

The Accelerator Driven Test Facility (ADTF) is being developed as a reactor concepts test bed for transmutation of nuclear waste. A 13.3 mA continuous-wave (CW) proton beam will be accelerated to 600 MeV and impinged on a spallation target. The subsequent neutron shower is used to create a nuclear reaction within a subcritical assembly of waste material that reduces the waste half-life from the order of 10<sup>5</sup> years to 10<sup>2</sup> years. Additionally, significant energy is produced that can be used to generate electrical power.

The ADTF proton accelerator consists of room-temperature (RT) structures that accelerate the beam to 6.7-MeV and superconducting (SC) elements that boost the beam's energy to 600-MeV. Traditional SC elliptical cavities experience structural difficulties at low energies due to their geometry. Therefore, stiff-structured SC spoke cavities have been adopted for the energy range between 6.7 and 109 MeV. Elliptical cavities are used at the higher energies. This paper describes a multi-spoke-cavity cryomodule concept for ADTF.