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## [Invited] Study of Temperature Wave Propagation in Superfluid Helium to Cool Radio-Frequency Cavities

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Oscillating Superleak Transducers (OSTs) can be used to localize quenches in superconducting radio-frequency cavities. Local hot spots at the cavity surface initiate temperature waves in the surrounding superfluid helium that acts as cooling fluid at typical temperatures in the range of 1.6 K to 2 K. The temperature wave is characterised by the properties of superfluid helium as the second sound velocity. For high heat load densities second sound velocities greater than the standard literature values are observed. This fast propagation has been verified in dedicated small scale experiments. Resistors were used to simulate the quench spots under controlled conditions. The three dimensional propagation of second sound is linked to OST signals and is improving the understanding of the OST signal especially there incident angle dependency. The characterised OSTs are used as a tool for quench localisation on a real size cavity. Their sensitivity as well as the time resolution was proven to be superior to temperature sensors, which were glued to the surface of the cavity.

**Primary author:** KOETTIG, Torsten (CERN)

**Co-authors:** PETERS, Benedikt Josef (KIT - Karlsruhe Institute of Technology (DE)); BREMER, Johan (CERN); JUNGINGER, Tobias (CERN)

**Presenter:** KOETTIG, Torsten (CERN)

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