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Analysis of FCC Nb₃Sn Conductor at CERN

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In order to develop superconducting wires meeting the requirements for the 16 T dipole magnets proposed for FCC-hh, CERN is coordinating a conductor development programme, now involving 6 manufacturers and 6 academic partners.

A key goal of the programme is to develop Nb₃Sn wires with a non-copper critical current density (J_c) of 1500 A mm⁻² at 16 T and 4.2 K, and to demonstrate their suitability for long-length manufacturing and cabling.

In this presentation, the progress with this development will be reported, with a particular focus on superconducting characterisation and quantitative microscopy performed at CERN of recently developed Nb₃Sn wires with novel layouts. Initial evidence of the suitability of these designs for the production of Rutherford cables will be presented based on rolling studies and cabling trials.

Finally, at a stage of the programme at which the interim target of a J_c comparable with the HL-LHC wire specification has been achieved, the next steps for the development will be briefly summarised.

Author: Dr HOPKINS, Simon (CERN)

Co-authors: Dr BASKYS, Algirdas (CERN); BORDINI, Bernardo (CERN); Dr BALLARINO, Amalia (CERN)

Presenter: Dr HOPKINS, Simon (CERN)

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