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Tue-Mo-Po2.13-12 [118]: Study on the defects degree and flat-rolling reduction of round wires of Nb₃Sn Rutherford Cable for High-Energy Accelerators

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The advantages of superconducting Rutherford cables are that it can reduce the inductance and increase the stability of superconducting magnets. Due to its high critical field strength and high current carrying capacity Nb₃Sn Rutherford cable is one of the best choices for making high field accelerator superconducting magnets. But Nb₃Sn superconducting wire has poor mechanical properties and the current carrying capacity is reduced with the increase of strain. Therefore during the preparation of the Nb₃Sn Rutherford cable the difficulty is to control the strain of the Nb₃Sn wire and to reduce the attenuation of the current carrying capacity. In order to simulate the deformation of the Rutherford cable at the corner the flat-rolling method is used. With the different flat-rolling heights the different deformation degrees is caused to measure the influence the properties of different wire structures and different wire design parameters. The properties reduces as the flal-rolling height increases. The results of the properties, the flat-rolling parameters and the microstructure of strands of Rutherford Cable are discussed together.

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