

INPAC Lectures on Modern Trends in Nanosciences

Riding on Magnetic Fields: The Miraculous World of Superconductors

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Coffee at 15h45

Celestijnenlaan 200D, room 05.11

Abstract:

At present different concepts for magnetic levitation are discussed. The conventional system is the Transrapid, which is now mostly regularly running between Shanghai Airport and Shanghai Centre. Our approach is a passive superconducting magnetically levitated system, which uses bulk superconductors cooled to liquid nitrogen temperature. At low temperatures, superconductors do not only carry the electrical current without any resistance, but are also able to freeze in a magnetic field of any configuration. By this, they act as permanent magnets, but with a magnetic remanence, which is, for example for massive YBaCuO material, by far larger than that of ferromagnetic permanent magnets. The ability to freeze in a magnetic field can be used for completely new applications. In the presentation, this will be explained for different types of superconducting magnetically levitated trains, which can either be in an upright position, in a hanging position or moving along a wall without any mechanical contact. With regard to scaling-up, the SupraTrans project will be presented.

