



MT 26
International Conference
on Magnet Technology
Vancouver, Canada | 2019

Contribution ID: 1679

Type: **Contributed Oral Presentation**

Thu-Af-Or21-05: Potential of Long Solenoid Coil as Superconducting Cable with Energy Storage Function

Thursday, 26 September 2019 15:00 (15 minutes)

We have proposed a novel superconducting electric power system with energy storage function. This system will overcome the obstacles for future large-scale utilization of renewable energies by compensating their output power fluctuation. In particular, the potential of a long solenoid coil as a superconducting cable with energy storage function has been investigated in this study. This means that the superconducting cable can be used not only for highly effective power transfer but also for high-power energy storage compensating output power fluctuation from renewable energies. The research and development for this concept have been proceeded as a Japanese project since 2017 with a final target in 2050. The conceptual design of the superconducting cable and the operation of its small prototype in a hardware-in-the-loop simulation (HILS) will be presented.

This work was supported by the New Energy and Industrial Technology Development Organization (NEDO), JSPS KAKENHI Grant Number JP18K18864, and The Iwatani Naoji Foundation.

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Session Classification: Thu-Af-Or21 - Novel Applications and Power Applications