Characteristics of Maglev Vehicle Dynamics Considering Cars with Onboard REBCO SCMs

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Onboard REBCO (rare-earth-element-based high temperature superconductor) SCMs (superconducting magnets) for Maglev vehicles are being developed, that do not require costly refrigerants such as liquid helium, since their operating temperature is higher than that of conventional SCMs. Their simplified refrigeration system results in reduced vehicle weight and makes it possible to reduce the gap between the SCM and guideway coils, which in turn can be expected to yield benefits such as improved electromagnetic force characteristics. And if the same electromagnetic characteristics as those of conventional SCMs are to be maintained, the energizing power of REBCO SCMs can be lowered, making it possible to reduce the magnetic fields and the weight of the magnetic shielding materials in the car body.