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Observation of spinon spin currents in one-dimensional spin liquid[1] DAICHI HIROBE, Tohoku Univ., Japan, MASAHIRO SATO, Ibaraki Univ., Japan, TAKAYUKI KAWAMATA, YUKI SHIOMI, Tohoku Univ., Japan, KEN-ICHI UCHIDA, NIMS, Japan, RYO IGUCHI, YOJI KOIKE, Tohoku Univ., Japan, SADAMICHI MAEKAWA, ASRC, JAEA, Japan, EIJI SAITOH, Tohoku Univ., Japan — To date, two types of spin current have been explored experimentally: conduction-electron spin current and spin-wave spin current. Here, we newly present spinon spin current in quantum spin liquid [1]. An archetype of quantum spin liquid is realized in one-dimensional spin-1/2 chains with the spins coupled via antiferromagnetic interaction. Elementary excitation in such a system is known as a spinon. Theories have predicted that the correlation of spinons reaches over a long distance. This suggests that spin current may propagate via one-dimensional spinons even in spin liquid states. In this talk, we report the experimental observation [1] that a spin liquid in a spin-1/2 quantum chain generates and conveys spin current, which is attributed to spinon spin current. This is demonstrated by observing an anisotropic negative spin Seebeck effect along the spin chains in Sr2CuO3. The results show that spin current can flow via quantum fluctuation in spite of the absence of magnetic order, suggesting that a variety of quantum spin systems can be applied to spintronics. [1] D. Hirobe, *et al.* Observation of spinon spin currents. *Nat. Phys.* online publication (DOI: 10.1038/nphys3895).

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