报告一 题目：Efficient pure spin current and it′ s application

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报 告 摘 要：

In recent years, the increased usage of compute-intensive applications such as artificial intelligence (AI), Internet of Things (IoT), and cloud computing has led to data transfer and energy consumption becoming bottlenecks for chip technology in the post-Moore's Law era. To overcome this bottleneck, a new computing and memory architecture called Computing in Memory (CIM) technology has emerged. One of the newer CIM architectures is Spin-logic In-memory (SLIM), which adds programmable spin logic to memory. SLIM allows direct data computation within the memory based on generation, injection, modulation, and detection of pure spin current in lateral spin valves. Searching the excellent materials for efficient excited pure spin current is becoming emergency. Here, we systemically studied the electrically and thermally excited pure spin current in CoFeAl/Cu hybrid nanostructures by employing lateral spin valve. We found the electrically excited pure spin current are strongly enhanced due to the large spin polarization which reduces the back flow of the spin current. The robust thermally excited pure spin current is also obtained in CoFeAl/Cu hybrid nanostructures because of the opposite sign of Seebeck coefficient for the up and down spins. Some applications of such efficient excitation of pure spin current are also demonstrated by using CoFeAl/Cu hybrid nanostructures.