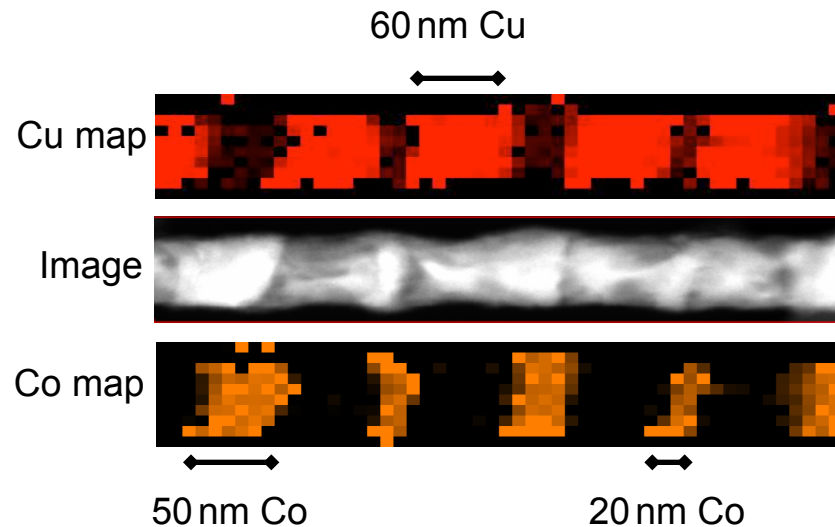


Spin Transport in Nanowires

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Element-sensitive scanning transmission electron microscopy reveals the composition of these multilayer nanowires. The thinnest Cu spacers produce a sizable 12% GMR at room temperature, consistent with interlayer exchange coupling. This coupling weakens with increasing Cu thickness, until a spin valve results. The evolution between these regimes provides new insights into spin diffusion in restricted geometries.

The interplay between spin transport and exchange coupling profoundly affects charge transport between conventional metals and ferromagnets. This results in giant magnetoresistance and the spin valve effect in multilayer thin films, phenomena of great importance for magnetic data storage. MRSEC researchers have developed Co-Cu-Co multilayer nanowires to explore these phenomena in nanowire geometries.

