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Giant thermoelectric effects in a proximity-coupled superconductor-ferromagnet device PETER MACHON, Department of Physics, University of Konstanz, D-78457 Konstanz, Germany, MATTHIAS ESCHRIG, SEPnet and Hubbard Theory Consortium, Department of Physics, Royal Holloway, University of London, Egham, Surrey TW20 0EX, United Kingdom, WOLFGANG BELZIG, Department of Physics, University of Konstanz, D-78457 Konstanz, Germany — The usually negligibly small thermoelectric effects in superconducting heterostructures can be boosted dramatically due to the simultaneous effect of spin-dependent scattering and spin-filtering. Build on our idea [Phys. Rev. Lett. **110**, 047002 (2013)], we propose realistic setups to measure local thermoelectric effects in superconductor heterostructures. We focus on the Seebeck-effect which is a direct measure of the local thermoelectric response and find that a thermopower $\sim 100\mu V/K$ can be achieved if a third terminal allows to drain the thermal current. A measurement of the thermopower can furthermore be used to determine quantitatively the spin-dependent interface parameters that induce the spin splitting. For applications in nano-cooling we discuss the figure of merit that we found to exceed one for realistic parameters.

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