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Flexible thermoelectric films using the spin Seebeck effect AKIHIRO KIRIHARA, MASAHIKO ISHIDA, HIROKO SOMEYA, NEC Corporation, KOICHI KONDO, NAOHARU YAMAMOTO, NEC Tokin Corporation, KEN-ICHI UCHIDA, EIJI SAITOH, Tohoku University, SHIGERU KOHMOTO, TOMOO MURAKAMI, NEC Corporation — Thermoelectric (TE) technologies have been of great interest, since they can directly generate electricity from thermal energy that is available in various places. For making full use of such omnipresent heat, TE devices using the spin Seebeck effect (SSE) potentially open opportunities for large-area TE applications, because of their favorable features such as a simple film structure and convenient scaling capability [1]. In this work, we show a SSE-based flexible TE device, which consists of metallic and magnetic-insulator films on a 25-um-thick polyimide substrate. Novel fabrication processes enabled us to form the magnetic insulator, having a good spin-current-conduction property for the SSE, on the highly flexible organic film. Such flexible TE sheets are readily implementable on various curved or uneven surfaces, leading to versatile energy-harvesting and heat-sensing applications. [1] A. Kirihara, et al., Nature Mat. 11, 686 (2012).

Akihiro Kirihara
NEC Corporation

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