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Spin pumping from a ferromagnet into a hopping insulator: Role of resonant absorption of magnons[1] MIKHAIL RAIKH, YUE ZHANG, DMYTRO PESIN, Univ of Utah — Motivated by recent experiments [1,2,3] on spin pumping from a ferromagnet into organic materials in which the charge transport is due to hopping, we study theoretically the generation and propagation of spin current in a hopping insulator. Unlike metals, the spin polarization at the boundary with ferromagnet is created as a result of magnon absorption within pairs of localized states and it spreads following the current-currying resistor network (although the charge current is absent). We consider a classic resonant mechanism of the ac absorption in insulators and adapt it to the absorption of magnons. A strong enhancement of pumping efficiency is predicted when the Zeeman splitting of the localized states in external magnetic field is equal to the frequency of ferromagnetic resonance. Under this condition the absorption of a magnon takes place within *individual* sites.

[1] K. Ando *et al.,* Nat. Mater. **12**, 622 (2013).
[2] S. Watanabe *et al.,* Nat. Phys. **10**, 308 (2014).
[3] Z. Qiu *et al.,* AIP Advances **5**, 057167 (2015).

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