Generating spin currents mechanically in a semiconductor\textsuperscript{1}

PRASHANT SHARMA, Argonne National Laboratory — It is theoretically predicted that a traveling shear wave will create a spin current in certain direct-gap (for example III-V compound) semiconductors with contributions from both the valence bands and the conduction band (for $n$-doped semiconductors). We show that this spin-current is a property of the Fermi-Dirac sea, and is controlled by a geometric phase accumulated by the strain-induced Rashba parameters in a cycle.

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