A. A. Samokhvalov. *Active electron-magnon interaction in magnetic semiconductors.* This paper reported on excitation of magnons by current carriers in magnetic semiconductors—new active electron-magnon interaction phenomena that have been detected in experimental studies of magnetic semiconductors such as EuO and $CdCr_2Se_4$ in strong electric fields. The theory of these phenomena predicts amplification of spin waves, Cherenkov generation of magnons, and their heating by drifting current carriers.[2] Experiments have detected Cherenkov generation of magnons, which results in a threshold decrease of electrical conductivity when the carrier drift velocity exceeds the lowest spin-wave phase velocity, heating of carriers accompanied by nonlinearities of the volt-ampere characteristic,[3] and heating of magnons, which results in a lowering of magnetization.[4,5]

It was concluded that the results on excitation of magnons by hot carriers are encouraging though early steps on the way into a new field of applied solid-state physics based on magnetic semiconductors—semiconductor magnetoelectronics, which offers new opportunities for contemporary electronic engineering.

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I. M. Tsidil'kovskiĭ. *Gapless semiconductors: A new class of substances.* The possibility in principle that a gapless electron energy spectrum might exist was predicted in 1934 by S. P. Shubin and S. V. Vonsovskiĭ. It was established in 1955 that HgTe is a gapless semiconductor. The gapless state in crystals of HgTe and HgSe and solid solutions based on them is a result of degeneration of the electron and valence bands at the center of the Brillouin zone Γ. This degeneration is due to the cubic symmetry of the crystal and can be lifted only by a disturbance of lower symmetry—a magnetic field or a uniaxial stress. The most important parameter of electron structure—the energy gap ε_g between the neighboring Γ_6 (s-type) and Γ_8 (p-type) zones—depends on the pressure P, the temperature T, and the content x of the element in $Hg_{1-x}A_xS$ crystals (A is a group II element or other atom with an isoelectronic valence shell, S, Se, Te). Under these external disturbances, the electron spectrum undergoes significant changes, all the way up to inversion of the Γ_6 and Γ_8 zones, which corresponds to transition from a gapless (GL) to an ordinary semiconductor. Lifting the degeneracy of the Γ_8 zones, a quantizing magnetic field opens a gap $\delta(H)$, i.e., it also causes the GL-to-semiconductor transition. The value of $\delta(H)$ may become large at small $|\varepsilon_g|$. With an appropriate combination of