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Probing wavenumbers of current-induced excitations in point-contact experiements MAXIM TSOI, The University of Texas at Austin, ZHEN WEI, The University of Texas at Austin — The magnetic state of a ferromagnet can be altered by an electrical current. For instance, the current was shown to induce spin waves, precession, and reversal of magnetization in magnetic nanostructures. Today a variety of experimental techniques provide a vast amount of data on such current-induced excitations. A typical experiment usually exploits dc resistance measurements to detect the excitations. In addition, high-frequency techniques can provide valuable information on frequencies of the current-induced spin waves. Probing wavenumbers of the excitations, however, represents an experimental challenge. Point contacts were instrumental both for our original observation of current-induced excitations and in providing the first data on frequencies of the current-induced spin waves. In the present work we demonstrate that point-contact technique can also provide valuable information on the wavenumber of spin waves induced by the current. By varying the size of point contacts we have been able to control the size of the excitation volume and therefore the wavelength of current-induced spin waves. This leads to a technique with in situ sensitivity to wavenumbers of current-induced excitations. The detailed size-dependent measurements of the current-induced excitations display an interesting relation between current and voltage thresholds for such excitations.

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