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Band edge noise spectroscopy FARKHAD ALIEV, JUAN PEDRO CASCALES, Universidad Autonoma de Madrid, FREDERIC BONELL, STEPHANE ANDRIEU, Universite Poincare Nancy — Although metal/insulator interfaces are expected to play a major role in charge, spin and phonon flow, little is known about the real underlying band structure. The reason is the difficulty in directly obtaining this information from interfaces by the use of a non-invasive physical tool. Here we introduce and demonstrate the feasibility of a conceptually new method that enables us to gather information on the interface electron bands. The low frequency and low temperature noise measurements as a function of applied bias voltage clearly reveal the appearance of the electron band edges at the Fermi level. By analyzing the bias dependence of the normalized 1/f noise (Hooge factor) in Fe1-xVx/MgO/Fe (with $0< x< 0.16$) epitaxial magnetic tunnel junctions with diminished misfit dislocations, we observe strong anomalies in the 1/f noise at specific voltages where the band edges of the ferromagnetic electrodes which form the tunnel junction are expected to cross the Fermi level. These effects, understood within a simple model of 1/f noise due to localized states near the band edges, open up new perspectives for a reliable "in situ" characterization of electron bands in normal metal or spintronic devices.

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