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**Anomalous Sub-Gap features in Nb/Ni Tunneling DOS** PAUL SANGIORGIO, MALCOLM BEASLEY, Stanford University, JUNHYUNG KWON, KOOKRIN CHAR, Seoul National University — We report the existence of anomalous sub-gap features in tunneling DOS measurements of Superconductor/Strong Ferromagnet bilayers. By measuring the DOS as a function of ferromagnet thickness,  $d_F$ , we are able to document the spatial evolution of the Cooper pairs diffusing into the ferromagnet. This technique proves to be much less sensitive to variations in boundary conditions and provides more detailed information per sample than traditional  $T_c$  or  $J_c$  measurements. In addition to the sub-gap features, we find that the DOS shows the usual peaks at  $\pm\Delta_0$ , which “invert” at  $d_F = 3.5$  nm. We analyze the results with the fully non-linear Usadel equation, including the effects of various scattering mechanisms and spin-dependent boundary conditions. We are able to quantitatively account for the features at  $\pm\Delta_0$  through the addition of spin-orbit scattering in the F-layer, but we find that no known parameter recreates the sub-gap features. By examining the behavior of the sub-gap in magnetic field, we propose that it is a signature of a long-range triplet condensate.

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