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Evidence for a π-junction in Nb/F/Nb' trilayers from superfluid density measurements[1] THOMAS LEMBERGER, MICHAEL HINTON, STANLEY STEERS, BRYAN PETERS, FENGYUAN YANG, The Ohio State University — Two-coil measurements of the sheet superfluid density of Nb/NiV/Nb' trilayers reveal the transition temperatures and volume superfluid densities of both Nb layers, as functions of the thickness, d_F, of the intervening ferromagnetic (F) $Ni_{0.96}V_{0.04}$ layer. The upper transition occurs when the thicker Nb layer goes superconducting and superfluid first appears. Fitting the high-temperature superfluid density to an appropriate functional form reveals the presence of a lower "transition" where additional superfluid appears. This event is really a crossover, but the difference is irrelevant here. There is a surprising minimum in superfluid densities of both Nb layers at $d_F \approx 30$ Å, followed by a slow rise. This behavior suggests that a π phase difference between the Nb layers develops at $d_F \approx 30$ Å and continues to larger F thickness.

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