Title:	Spectroscopic signature of two superconducting gaps and their unusual field dependence in RuB2
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Abstract:	Recently RuB2 was shown to be a possible two-gap, type-I superconductor. Temperature dependent heat capacity measurements revealed a two-gap superconducting ground state, while magnetic field dependent magnetization measurements indicated surprizing type-I superconductivity with a very low experimental critical field (Hc) ~120 Oe. In this paper, we report direct spectroscopic evidence of two superconducting energy gaps in RuB2. We have measured scanning tunnelling spectra exhibiting signature of two gaps on different grains of polycrystalline RuB2, possibly originating from multiple bands. Analysis of the temperature dependent tunnelling spectra revealed that the gaps from different bands evolve differently with temperature before disappearing simultaneously at a single Tc. Interestingly, our experiments also reveal that the gaps in quasiparticle density of states survive up to magnetic fields much higher than the bulk Hc and they evolve smoothly with field, unlike what is expected for a type-I superconductor, indicating the existence of a 'mixed state'.
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