

# Session 27aB

## Tunneling Between Spin Triplet Molecular Organic Superconductors

27aB1

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We present the first ever tunneling data between two organic superconductors. Current - voltage measurements were taken on a bicrystal of the molecular organic superconductor (TMTSF)<sub>2</sub>ClO<sub>4</sub> ( $T_c=1.3\text{K}$ ). Strong evidence for spin triplet pairing has accumulated recently for this class of materials. We interpret the resulting dI/dV conductance vs. bias as representing a S-I-N-I-S junction between two triplet superconductors ("TNT"). An enormous zero bias conductance peak likely due to Andreev bound states (possibly coupled with Josephson effect) is observed, as well as a clearly identified superconducting energy gap of 0.5 meV ( $2\Delta=4.2k_B T_c$ ). Magnetic field studies show a Zeeman effect which provides information on the direction of the order parameter **d**-vector. We discuss the relevance of these results to the pairing symmetry (*p* or *f*-wave) of this spin triplet superconductor. This work was supported by the NSF.

## Pseudogap, field-induced SC-AFI transition and quantum critical spin fluctuations in two-dimensional organics

27aB2

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A family of quasi-two-dimensional organic conductors,  $\kappa\text{-(ET)}_2X$ , span a phase diagram including superconducting (SC) phase and antiferromagnetic insulating (AFI) phase. In this conference, we present our NMR observation of the pseudogap behavior and field-induced SC-AFI transition in the marginal superconducting phase, to which access was made by deuterated  $\kappa\text{-(ET)}_2\text{Cu[N(CN)}_2\text{]Br}$ . We also report that a doped Mott insulator,  $\kappa\text{-(ET)}_4\text{Hg}_{2.78}\text{Cl}_8$ , show quantum critical AF fluctuations in contrast to  $\kappa\text{-(ET)}_2X$  with half-filled band.

**27aB3      Anisotropic Superconductivity in Magnetic Field Induced Superconductors  
 $\lambda$ -(BETS) $_2$ Fe $_x$ Ga $_{1-x}$ Cl $_4$** 

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We have measured the resistance of the organic conductors  $\lambda$ -(BETS) $_2$ Fe $_x$ Ga $_{1-x}$ Cl $_4$  and found the anisotropic feature of the critical fields.

**27aB4      Genuine Two Dimensional Electrons in Bechgaard Salts**

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We will present our comparative study of Bechgaard salts which have played a key role to develop the physics of quasi-one-dimensional electron systems. However, our recent investigations revealed that a genuine two dimensional electron system can also be realized in this system. Angular magnetoresistance (AMR) of (TMTSF) $_2$ FSO $_3$  under 8.2 kbar showed oscillatory behavior just like as many other (TMTSF) $_2$ X salts. However, the peak positions could not be explained with Lebed resonance model but with Yamaji resonance model. The former has been successfully used to explain the AMR of (TMTSF) $_2$ X and the latter for two dimensional (ET) $_2$ X. Also supporting the idea is a pronounced peak structure observed both in *bc* and *ac* rotations when the magnetic field was nearly parallel to the conducting plane.