

Abstract Submitted  
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**Localized states in Mott insulator  $\kappa$ -(BEDT-TTF)<sub>2</sub>Cu[N(CN)<sub>2</sub>]Cl probed by photoluminescence**<sup>1</sup> NATALIA DRICHKO, Johns Hopkins University, RUDI HACKL, Walter Meissner Institute Garching Germany, JOHN SCHLUETER, Argonne National Laboratory — We present the luminescence spectra of a low-temperature Mott insulator ( $T_c=35$  K)  $\kappa$ -(BEDT-TTF)<sub>2</sub>Cu[N(CN)<sub>2</sub>]Cl and a metal with a superconductor transition  $\kappa$ -(BEDT-TTF)<sub>2</sub>Cu[N(CN)<sub>2</sub>]Br in the temperature range between 300 and 10 K. In the Mott insulating state we observe an appearance of a luminescence at 1.95 eV, which corresponds to a LUMO-HOMO transition in a BEDT-TTF molecule. This luminescence is quenched both in the higher-temperature semiconducting state of  $\kappa$ -(BEDT-TTF)<sub>2</sub>Cu[N(CN)<sub>2</sub>]Cl and metallic  $\kappa$ -(BEDT-TTF)<sub>2</sub>Cu[N(CN)<sub>2</sub>]Br. To our knowledge, it is the first observation of luminescence driven by electronic correlations. This observation gives an evidence of the local character of BEDT-TTF energy levels in the Mott insulating state, in contrast to the band-character in the metallic and semiconducting states.

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Natalia Drichko  
Johns Hopkins University

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