Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Hybrid quantum systems with YBCO coplanar resonators and spin ensembles of organic radicals ALBERTO GHIRRI, Istituto Nanoscienze - CNR, Centro S3, via Campi 213/a, 41125 Modena, Italy, CLAUDIO BONIZZONI, Dipartimento FIM, Universita di Modena e Reggio E. and Istituto Nanoscienze - CNR, via Campi 213/a, 41125 Modena, Italy, FILIPPO TROIANI, Istituto Nanoscienze - CNR, via Campi 213/a, 41125 Modena, Italy, ANTONIO CASSINESE, CNR-SPIN and Dipartimento di Fisica, Universita?? di Napoli Federico II, 80138 Napoli, Italy, MASSIMILIANO D'ARIENZO, LUCA BEVERINA, Department of Materials Science State University of Milano-Bicocca Via Cozzi 55 I-20125 Milano, Italy, MARCO AFFRONTE, Dipartimento FIM, Universita di Modena e Reggio E. and Istituto Nanoscienze - CNR, via Campi 213/a, 41125 Modena, Italy
— We have studied the coherent coupling of microwave photons in a superconducting coplanar resonator with a spin ensemble of stable open-shell organic radicals. We fabricated YBCO/sapphire coplanar resonators that show quality factors $\simeq$ 3*10ˆ4 at 1.8 K, that remain remarkably stable in high magnetic field applied parallel to the YBCO film [QL (7 T) = 90% QL (0 T)] [1]. Spin ensembles of (3,5-Dichloro-4-pyridyl)bis(2,4,6-trichlorophenyl)methyl organic radical (PyBTM) show sharp EPR linewidth (8 MHz) due to the effect of the exchange narrowing. The frequency of the spin transition is tuned by means of the external magnetic field. We show the achievement of the strong collective coupling with the resonant photons with coupling rates exceeding 90 MHz at 1.8 K. [1] A. Ghirri, C. Bonizzoni, D. Gerace, S. Sanna, A. Cassinese and M. Affronte, Appl. Phys. Lett. 106, 184101 (2015).

Alberto Ghirri
Istituto Nanoscienze - CNR, via Campi 213/a, 41125 Modena, Italy

Date submitted: 06 Nov 2015 Electronic form version 1.4