

Abstract Submitted  
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**Two-Dimensional quantum dynamic in a dc SQUID**<sup>1</sup> FLORENT LECOCQ, Institut Neel, CNRS, Grenoble, France, I.M. POP, Z. PENG, I. MATEI, C. NAUD, F.W. HEKKING, W. GUICHARD, O. BUISSON, Institut Neel and LPMMC, CNRS, Grenoble, France, R. DOLATA, A.B. ZORIN, PTB, Braunschweig, Germany — The dynamics of a dc SQUID presents a large variety of quantum effects at very low temperature such as 2D MQT signature, multilevel and phase qubit dynamics. We have shown that along the zero current bias line, the quantum dynamics is protected from current fluctuations. Along this line, the potential is quadratic-quartic and enhanced phase qubit properties have been demonstrated<sup>2</sup> When the dc SQUID loop inductance is of the order of the Josephson inductance the dynamic becomes two dimensional. As a consequence, in addition to the oscillation mode producing the phase qubit, a second oscillation mode exists, called transverse mode. Here we report spectroscopic evidence and coherence properties of both oscillators as well as coherent oscillations between the quantum states of these two coupled oscillators.

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<sup>2</sup>E. Hoskinson et al, Phys. Rev. Lett. 102, 097004 (2009)

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