

Abstract Submitted
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Creating the first Bose-Einstein Condensate in Space M. LACHMANN, S. SEIDEL, D. BECKER, H. AHLERS, T. WENDRICH, LU Hannover, J. GROSSE, H. MNTINGA, ZARM, Bremen, B. WEPS, DLR-SC, A. DINKELAKER, V. SCHKOLNIK, HUB Berlin, O. HELLMIG, U Hamburg, A. WENZLAWSKI, JGU Mainz, W. HERR, N. GAALOUL, E. RASEL, W. ERTMER, LU Hannover, QUANTUS COLLABORATION — On 23rd of January 2017 the first Bose-Einstein Condensate (BEC) in Space was created onboard the sounding rocket mission MAIUS-1. The successful launch marks a major advancement in the effort of performing matter wave interferometry with BECs on space vehicles. Its high BEC-flux enables more than 100 experiments during flight, characterizing the creation of BECs in space, their free evolution, state preparation, and the creation of cold atoms in highly dynamic environments. MAIUS-1 opens a new path towards space borne inertial sensing employing interferometers with high accuracy and sensitivity. Two follow-up missions will investigate dual-species interferometry. Recently several missions were proposed ranging from tests of the universality of free fall to gravimetry. Due to their small initial size and low expansion rates BECs are the ideal source for such an interferometric measurement. The findings of the mission will contribute to the NASA CAL project and BECCAL (NASA and DLR). DLR under grant 50WP1435

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