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MAIUS-B: Towards dual species matter wave interferometry in space[1] BAPTIST PIEST, WOLFGANG BARTOSCH, JONAS BHM, MAIKE LACHMANN, MAGDALENA MISSLISCH, VERA VOLLENKEMPER, THIJS WENDRICH, ERNST RASEL, Univ Hannover, QUANTUS TEAM — After the successful launch of the MAIUS-1 mission and the first demonstration of Bose-Einstein condensation and coherent matter wave manipulation in space [1] we aim for two-species atom interferometers on the sounding rocket missions MAIUS-2 and -3. The new system contains, in addition to Rb-87, K-41 as a second species and will utilize Raman double-diffraction enhanced beam splitters. As part of our flight preparations we have set up a test bed including the original physics package and a ground-based laser and electronics system which closely resembles the flight configuration. In our ground-based experiments we succeeded in generating Bose-Einstein condensates containing more than $3 \cdot 10^5$ Rb-87 atoms and $5 \cdot 10^4$ K-41 atoms in less than 2.5 s. Recently developed laser cooling schemes like sub-Doppler cooling of K-41 on the D1-line [2] and blue-detuned magneto-optical trapping of Rb-87 [3] have been proven to work efficiently on our atom chip setup giving perspectives for future space missions using compact setups. Here, we give an overview of the planned sounding rocket missions and present the current status of the ongoing experiments. [1] D. Becker et al., Nature **562**, 391 395 (2018) [2] H. Chen et al., PRA **94**, 033408 (2016) [3] K. N. Jarvis et al. PRL **120**, 083201 (2018)

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