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LISA Dynamics & Control: DFACS Simulation and Optimization, Noise assessment and Data processing

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LISA detection principle and sensitivity relies strongly on successful suppression of spacecraft dynamical jitter noise trough post-processing data combination (TDI, INREP). However residuals due to cross-couplings are expected to be important entries to the current noise budget, and in general, post-processing suppression of spacecraft stray motions have not yet been subject to numerous numerical studies & optimizations. In this talk we present a first implementation of the Dynamics of LISA spacecraft and test masses within the current end-to-end simulation of LISA. It allows demonstrating numerically the full suppression of spacecraft jitter when cross-couplings are deactivated, as well as, will provide quantitative estimates for the residual spacecraft jitters potentially leaking to the science channel. In addition, we discuss an optimization strategy for the DFACS which participates to the mitigation of such couplings. This last work have also inspired possible data combinations for local, independent measurements of test mass acceleration noise, hence providing precious information for data processing and analysis.

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