AEROSPACE ENGINEERING

MUR DM 117/CIRA - Shape reconstruction of a space structure from strain measurements

Funded By	CIRA S.c.p.A. [P.iva/CF:01908170614] Ministero dell'Università e della Ricerca - MUR [P.iva/CF:96446770586] Politecnico di TORINO [P.iva/CF:00518460019]

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Context of the research activity	The research activity aims at the development and assessment of a deformed shape reconstruction approach for a space structure based on discrete strain measurements. The application of this structure for precision positioning requires accurate knowledge of its geometric configuration under several external actions (thermal, inertial). Progetto finanziato nell'ambito del PNRR – DM 117/2023 - CUP E14D23001970004

Objectives	The development of the reconstruction approach must be based on real-time methodologies and on an optimal distribution of strain sensors. The validation of the approach will be performed both numerically (simulating the behavior of the structure with accurate numerical models) and experimentally (conducting an experimental campaign on simplified, reduced-scale prototypes). The proposed topic falls within the framework of space exploration and space economy, thus being consistent with important guidelines of the PNRR, in particular with the M4C2 Mission - "From Research to Business" - Investment 3.3 - "Introduction of innovative PhD fellowships that respond to the innovation needs of companies" and Mission M1C2 - "Digitalization, innovation and competitiveness in the production system" - Investment 4 - "Satellite technologies and space economy".

Skills and competencies for the development of the activity	Experience in structural analysis using FEM commercial codes. Programming skills (MATLAB, PYTHON). Knowledge of shape-reconstruction approaches and inverse problems.