

IAF/IAA SPACE LIFE SCIENCES SYMPOSIUM (A1)
Interactive Presentations - IAF/IAA SPACE LIFE SCIENCES SYMPOSIUM (IPB)

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INVESTIGATING THE MODULATION OF BLOOD FLOW BY ELECTROMAGNETIC FIELDS IN
HYPER AND MICROGRAVITY CONDITIONS FOR SPACE MEDICINE APPLICATIONS**Abstract**

The FarHEM-S project, a collaborative initiative by Gdańsk University of Technology and Medical University of Gdańsk, aims to explore the potential of electromagnetic fields (EMF) to influence blood flow in varying gravitational environments, specifically hyper and microgravity. This research addresses critical health concerns for astronauts subjected to long-duration (6 months and above) space missions, where altered gravity conditions significantly impact cardiovascular and circulatory systems. By employing hypergravity simulations alongside microgravity analogs, the study seeks to comprehensively understand how EMF interventions can modulate circulatory dynamics across the gravity spectrum. The experiment's methodology involves adjusting EMF parameters—intensity and frequency—in relation to different gravitational stresses to quantify their effects on blood flow and vessel pressure. Anticipated findings promise to enhance astronaut health and safety protocols by offering novel countermeasures against gravity-induced circulatory challenges. Additionally, terrestrial applications, particularly in treating circulatory disorders, stand to benefit from insights gained, marking a significant advancement in medical science and bioengineering. This project not only contributes to the body of knowledge in space medicine but also paves the way for innovative healthcare solutions on Earth.