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APPLICATION OF HUMAN CENTRIFUGE TO SIMULATE PARABOLIC FLIGHT: EARLY EXPERIENCE

*APPLICATION DE LA CENTRIFUÏE HUMAINE POUR SIMULER LE VOL PARABOLIQUE:
EXPÉRIENCE ANTÉRIEURE*

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Introduction: We have used the human centrifuge to simulate parabolic flight environment. Psychophysiological and technical aspects of using the centrifuge will be presented.

Method: Tests were carried out on five candidates taking part in a parabolic flight programme. The flight profile was adjusted to replicate characteristic conditions and specificity of a parabolic flight. The study was performed as a practical test in a variable acceleration environment similar to real parabolic flight (with G-limits: max. +2 Gz, min. 0 Gz, and 20 repetitions of a cycle). Evaluation of eye-hand coordination, orientation and Romberg tests were performed. Each candidate was monitored (HR, ECG, SaO₂, ear pulse). The exposure was performed twice on two consecutive days.

Results: All participants positively completed the expositions. They reported that they had the illusion of microgravity. They exhibited similar hand-eye coordination issues as in microgravity. However, with repeated exposures changes in their heart rate were decreasing, pointing to their adaptation to the procedure.

Conclusions: Trained behaviours and organism reactions have been afterwards successfully used and verified during the real parabolic flight organised by the ESA. Despite the preliminary nature of the study, there were obtained promising results, which may be further developed and ultimately used to improve the quality and effectiveness, especially cost effectiveness of ground preparation for astronauts to microgravity.