Student project proposal

Project title
Development of a permanent-magnet levitation system of a spheroid sculpture

Project type
☐ MSc thesis ☒ BA semester project ☒ MSc semester project

Project responsible and e-mail
Mario Paolone – mario.paolone@epfl.ch

Project description
The international EPFL “Artist in Residence” program, promoted by the EPFL College of Humanities under the title “Enter the Hyper-Scientific”, has selected the project “Spheroids: an exploration of exogeologies and exoecologies”. In this art-sculpture project, the student has to develop a 3D magnetostatic model that allows for a stable levitation of a solid sphere over an empty hemisphere by means of permanent magnets. A possible variant is to develop a slightly different solution where the stable levitation is combined with a slow rotation of the sphere. In both solutions, the sphere and hemisphere are made of fired clay and should account for placement variance of up to 2mm. The weight of the ceramic sphere would be between 500 and 750 g, not accounting for the permanent magnets. The sphere would need to show 5-7 cm of stable levitative lift without flipping.

Tasks of the student
▪ Develop a numerical model enabling to define the characteristics and placement of the permanent magnets.
▪ Help to develop a prototype of the sculpture.

Requirements
▪ Good understanding of magnetostatic problems.