

**1999 – 2000 Oregon State University Microgravity Flight Team**  
*Magnetically Assisted Fluidized Bed*

**Abstract**

We proposed to experimentally investigate the feasibility and quality of a liquid-solid fluidization operation in microgravity and variable gravity conditions. In an ordinary fluidization operation, gravitational force plays an important role in the balance of forces acting on each fluidized particle. Thus, in microgravity where gravitational force is absent, an ordinary fluidization operation is impossible.

We designed, manufactured, and tested a newly conceived Magnetically Assisted Fluidized Bed (MAFB) in which the role of the gravitational force can be substituted, to any desired degree, with a magnetic force. The magnetic force is produced in the interaction between a non-uniform magnetic field and magnetically susceptible fluidization particles. This force can be easily adjusted and controlled by altering the strength of the magnetic field and therefore be used to sustain the fluidization operation in both microgravity and variable gravity conditions.

The specially designed fluidization particles, containing ferromagnetic material, were manufactured in our lab as a part of a planned high school outreach program. The data collected from our test apparatus on board the KC-135 flight was communicated to academic and scientific communities.

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*sic itur ad astra*  
this way to the stars

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