Fabricating and Improving Variable Gravity Apparatus

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A senior member of the Joint Research Team of the Faculty of Sciences of the Evening Course has completed a small microgravity generator that can be used indoors. Although this apparatus lasted only 0.5 seconds, it was able to provide microgravity of good quality. Therefore, we wondered if it would be possible to generate the same kind of gravity on the Moon and Mars. We started designing the apparatus based on the idea that it would be possible to create gravity on the Moon and Mars by controlling the acceleration by applying Atwood's pulley. We have built and continued to improve the variable gravity apparatus with the aim of creating an experimental environment for understanding phenomena on celestial bodies with smaller gravity than that of the Earth.
By developing and adjusting a apparatus to reduce the vibration of the experimental capsule, which moves up and down, we have succeeded in creating gravity on the surface of the target celestial body. For Mars, we were able to generate a gravity environment of 0.362 ±0.014 G, which is equivalent to the gravity of the surface of Mars, for about 0.6 seconds. We also generated a lunar surface gravity environment of 0.154±0.013 G, although only for about 0.38 seconds.
In the future, we plan to generate a super earth gravity environment by adjusting the weight.

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