

Collaboration between high schools in Japan and Argentina for cosmic-ray research using Cosmic Watches

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Cosmic rays are ubiquitous and readily available, making them a good teaching tool for particle and astrophysics for young students. “Tan-Q” is an inclusive outreach and educational project, providing students in Japanese junior-high or high schools for research opportunities to join in cosmic-ray and particle physics (PI: K. S. Tanaka). In the Tan-Q framework, the students in each school conduct their own research with helps from mentors who are mainly undergraduate students. Researchers are also extensively involved through regular Zoom meetings and continuous communication on Slack. Some cases are inter-school and some are international. We use Python on Google Colaboratory for data analysis. Students start with the given template analysis codes, and modify and adapt the codes for each research themes supported by the mentors.

In this paper we present one of the Tan-Q activity that is a joint research between high schools in Japan and Argentina to observe cosmic-ray muons using Cosmic Watches. Cosmic Watch, originally developed by the MIT group, consists of a plastic scintillator with a SiPM and Arduino is used for data acquisition. Our primary goal is to investigate the muon flux differences due to the differences in circumstances like altitudes and geomagnetic field strengths. Those involved learn not only particle physics but also the statistical data analysis methods.

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Subcategory

Outreach and Education

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