Latest Nuclear Emulsion Technology: Production, Readout, and Interaction Analysis

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Nuclear emulsion is a extremely high-resolution 3D tracking detector. Since the discovery of the pion by C.F.Powel, et al. in 1946, experiments with nuclear emulsion have contributed development of particle physics. (e.g. OPERA collaboration reported the discovery of $\nu_\mu \to \nu_\tau$ oscillations in appearance mode in 2015)

The technology of nuclear emulsion still keeps making progress. Since 2010, we have introduced a system of nuclear emulsion gel production to our laboratory in Nagoya University, and have started self-development of the new gel, instead of the photographic film companies. Moreover, a faster automated emulsion scanning system is developed. Its scanning speed reaches 4000 cm^2/h, and a load for analyzing becomes more and more slight. In this presentation, we reports the status of nuclear emulsion technologies for cosmic ray experiments.

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