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Comparative Measurements of Cosmic Radiation Monitors for Aircrew Exposure Assessment

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Various commercially available electronic personal dosimeters (EPDs) have recently been flown on numerous scheduled airline flights in order to determine their viability as small, convenient monitors to measure cosmic radiation at altitude. Often, frequent flyers or airline crew will acquire such dosimeters and report the readings from their flights, without due regard for the mixed radiation field at altitude, which is different from the intended fields on land. A sampling of EPDs has been compared to two types of spectrometers, which measure the total radiation spectrum. The "HAWK" tissue equivalent proportional counter (TEPC) is considered the standard and measures the total dose equivalent H*(10). The Luilin-4N and 4SN LET spectrometers each have a silicon semiconductor-based PIN diode detector which provides an absorbed dose, D, but have been further developed to provide H*(10). An Eberline FH41B-10 and EPD N2, and several personal dosimeters (Rados DIS-100, Fuji NRY-21 and NRF-20) were also flown. The results of this comparison of the various monitors used, from spectrometers to simpler dosimeters, will be reported in the paper.