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## Chip-Sized Radiation Monitor

Costing as little as \$25 once mass-produced, chip-sized radiation monitors may soon find new homes in nuclear medicine and industry. Developed by the Jet Propulsion Laboratory (JPL; Pasadena, CA) and tested on the Clementine mission, the 1 -square centimeter chip combines a total dose monitor, a particle spectrometer, and read-out electronics all on a single integrated circuit package. Mass-production using complimentary metal oxide semiconductor technology should bring the cost 10\$25, down from \$2,000 per chip for a fully qualified, radiation tested chip for satellites.

While slated for further applications and testing on spacecraft and communication satellites, the chip also has more earthly uses. For example, it can monitor radiation doses given during cancer treatments or diagnostic testing, making such procedures safer and more efficient, and it can calibrate proton beams in cancer therapy facilities. Preliminary results indicate the calibration is easier to perform and more accurate than the standard ion chamber calibration. Selectively masking the chip's built-in broad-spectrum radiation detection for only specific radiation would allow it to function as both a personal and an area monitor at hospitals, veterinary clinics, life and physical science research laboratories, power plants, and nuclear waste cleanup sites.

With a sensitivity projected at one rad per bit the chip can distinguish among protons, alpha and beta radiation, ions, high-energy ions like those found in cosmic rays, x-rays, and gamma rays. JPL is pursuing commercialization of the new technology with several companies, and welcomes inquiries.

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