ISRP-4
SÃO PAULO
1988

IRPS

4th International Symposium on Radiation Physics

BOOK OF ABSTRACTS

OCTOBER 3 - 7, 1988
UNIVERSITY OF SÃO PAULO
SÃO PAULO - BRAZIL

Plastic Scintillator Detector Used as Water Radiation Monitor in a Swimming-Pool Research 2MW Reactor. Correlation Analysis Between Detector Results and Personal Dosimetry

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Plastic scintillator is a good solution in order to be used as a radiation detector when the water is the radioisotopic medium. It can detect easily alpha, beta and gamma radiation provided from a water source. According to these assertives a multi radiation detector was designed in order to be used as a monitor. The device was installed in the Brazilian swimming-pool research reactor working at a 2 MW power. The plastic scintillator probe (0=2", h=4") was coupled to a bialkaline phototube and packaged in a dark reservoir shielded with 3 cm thick lead. The water flow in the reservoir was maintained with a water pump. The internal dosimetry of the reactor operator staff was evaluated from whole-body measurements. The external dosimetry was determined from personal photographic dosimeters.