Daily Quality Assurance of Beam Output and Flatness using Diodes

Silicon diode detectors are used for in vivo dosimetry in radiation therapy. Since they are commonly found in a radiation therapy department and it is necessary to check the beam output and flatness in a daily basis, we have investigated the use of these diodes to monitor both these parameters. To avoid problems in properly setting up a dose measuring device (e.g. Sentinel or Tracker) in the beam, we have used five diodes plastered in the wall, at about 3 m from the isocenter, with one corresponding to the central axis, and four other to the corners of the maximum field size to give an indication of the beam flatness. These diodes are left permanently attached to the wall.

The response of the system to variation in the daily setup, i.e., setting the gantry to ± 1 degree of the 270 degree in which the detectors were calibrated only produces a 1% variation in the reading.

We have done measurements of beam output and flatness on a daily basis for about 10 days and have done weekly measurements for 82 days up to this point. The long term stability study is an ongoing project. Results indicate we can use this system as a substitute for beam output and flatness monitoring device. It is cost effective since all the departments usually have a system for diode dosimetry and each additional diode cost in the order of \$300-\$500.