**Monte Carlo simulations for electron backscattering in lead**

There is only an extensive experimental work on backscattering in electron therapy (Klevenhagen et al, *Phys. Med. Biol., 27, 363-373, 1982).* In this work we present simulations performed with Monte-Carlo GEANT code for electrons backscattered from lead slabs. The data are expressed in relation to the beam energy incident on the shield for energies ranging from 1 to 3 MeV. These energies are lower than the previously published data and still in the range of the electrons used in therapy. The depth dose curves and electron spectral distributions in the up-stream stream direction are also presented.

GEANT code has been used assuming multiple scattering and continuous energy-loss. Typical therapeutic energy spectra were used with $\overline{E}_0$ ranging from 5 to 10,75 MeV and $\overline{E}_z$ from 1 to 3 MeV (incident on the shield). Water phantom was simulated, in which a transversal score area of $0.25\times0.25$ mm$^2$ was established to collect deposited energy. Up to $3\times10^7$ histories were simulated.

Our simulation results show lower electron backscatter factors (EBF, defined as the ratio of dose at interface surface with and without the scatterer present) than Klevenhagen's results. For example, with $\overline{E}_z$= 2.3 MeV, EBF=1.53 against 1.63. For lower energies the values go down ($\overline{E}_z$= 1 MeV, EBF=1.48). EBF results don't show dependence on $\overline{E}_0$. Also we have established two relations for the backscattered electrons: $R_p^{back} \cong \frac{1}{5}(1+\overline{E}_{z,Pb})$, and the evolution of mean energy with depth *x*: $E_x^{back} \cong \overline{E}_0^{back}(1-\frac{f(E)}{R_p^{back}}x)$, where $f(E) = e^{-1.86+0.4\overline{E}_0^{back}}$ .