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Ultraviolet Channeling Radiation by Protons Accelerated at Medical Units

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CR in both optical and ultraviolet regions occurs under the condition n > 1 for the crystal refractive index (see [2]), i.e. at the large angles to the direction of motion for channeled particles - near Cherenkov angle.
This radiation can be used, for example, in biomedical research. In modern medical clinics the proton accelerators are in active use. By supplementing at such medical accelerator a relatively inexpensive device (optimized for channeling conditions), one can obtain a source of monochromatic ultraviolet radiation.

Summary

The number of CR-photons generated by 200 MeV (220) channeled protons in a diamond crystal reaches its maximum in the energy range 10.5⋯11,2 eV emitted at polar angle 59.765◦ . It is approximately 25 times greater than the number of Cherenkov photons. It would be additionally underlined that Cherenkov angle for 11,2 eV photons radiated by a 200 MeV proton is slightly less than 59.765◦ .

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