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A compact and mobile system for breast irradiation in prone position

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The APAM (Accelerators of Particles for Medical Application) Laboratory in the ENEA-Frascati Research Center developed a prototype of a self-shielded device dedicated to the treatment of breast cancer with the patient in prone position. It consists of a rotating X-ray source, based on a compact 3 MeV electron accelerator, placed under the patient bed which is provided with a circular opening through which the breast hangs down and can be irradiated. The system has been designed to suitably screen the patient body from the underlying accelerator. This setup improves target coverage and gives a valuable advantage in sparing healthy tissues: prone position increases the separation of the target and critical organs and in addition minimizes target motion caused by breathing. The prototype has been developed in the framework of the TECHEA (TECHnology for HEAlth) Project aimed to the realization and validation of prototype systems for applications to health protection. The paper describes the apparatus and reports the results of the experimental characterization of the X-ray source done in collaboration with the Laboratory of Medical Physics and Expert Systems of Regina Elena Hospital.

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Footnotes

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Yes

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