Proton radiotherapy is a very important tool in cancer treatment worldwide, with HZB providing the first such facility in Germany to more than 4000 patients until now. In 96% of these cases, the eye tumors have been successfully treated, without impairing the vision.

The irradiation of the small volume of an eye (< 7 cm³) requires μm precision in order to spare sensitive structures responsible for the eyesight (e.g. optical nerve). Existing range detectors on the market are designed for deeper tumors and fail to meet this strict demand.

To overcome this gap, a Multi-Leaf-Faraday Cup was developed at HZB, offering a quick and precise measurement of the proton range and the beam’s depth-dose curve. With an accuracy of 100 μm and a relative resolution of 50 μm in water, it exceeds the requirements for eye tumor therapy.

The company DE.TEC.TOR. (Devices & Technologies Torino, Italy) collaborated with HZB to commercialize this detector as a certified medical device, after refurbishing the original design and extending its capabilities. The final product was evaluated as an instrument for clinical quality assurance at the HZB proton therapy beamline and has already been sold to other proton therapy centers.

A license agreement (fixed know-how fee + royalties) has been concluded with the DE.TEC.TOR. company for the industrialization of the HZB knowledge.

1. HZB detector achieved the resolution requirements for eye tumor therapy (100μm)
2. Successful technology transfer to industry, leading to a certified medical device
3. Product advertised online: https://detector-group.com/qeye-storycase