HASPIDE

HAmorphous Silicon Pixel DEtector for ionising radiation

WP4: Beam monitoring

TASKS

T4.1 **Survey** of the facilities accessible by the Project's collaborators.
T4.2 **Definition of the priority of the clinical applications**, planning for accelerators availability, data taking and data analysis.
T4.3 **Preliminary test** on small non-optimized prototype.
T4.4 Design of the geometries and structures (In collaboration with WP1) for the fabrication of the first batch of devices.
T4.5 **Design of the phantoms for the single pixels** to be used with photon beams (HASPIDE-1D).
T4.6 Definition of the tests to be carried out at the facilities.
T4.7 Test with available prototypes.
T4.8 In collaboration with WP1, definition of the second batch of fabrication of pixelated devices
T4.9 **Design of the phantoms for the pixelated detectors to be used with stereotactic photon beams** (HASPIDE-SBRT). Definition of tests to be performed in available facility.
T4.10 In collaboration with WP1, definition of a third device to be used **with proton beams** (HASPIDE-p+). Definition of tests to be performed in available facility.
T4.11 **HASPIDE-1D test** on standard photon beams and data analysis
T4.12 **HASPIDE-SBRT test** on small photon beams and data analysis
T4.13 **HASPIDE-p+ test** on proton beams and data analysis

MILESTONES

M4.1- Defining of clinical application **M12**

M4.2Development of the devices designed for each clinical application **M24**

M4.3 Test on beams of the devices **M36**

DELIVERABLES

D4.1 Description of the clinical applications of HASPIDE detector **M12**

D4.2 Description of the HASPIDE devices **M24**

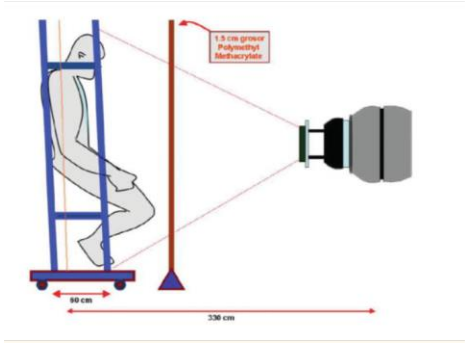
D4.3 Characterization of the HASPIDE devices **M36**

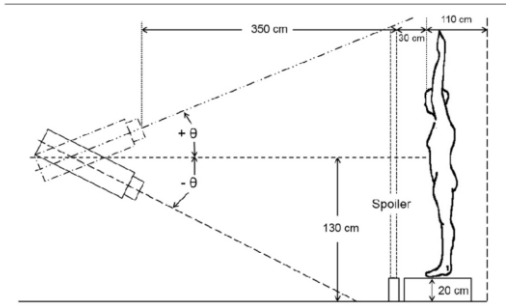
CLINICAL APPLICATIONS

- Linac QA

Rise and **fall times** (dose rate between : 50, 1200 cGy/min under 6MV FF and 6MV FFF photon beams).
Repeatability – (three cycles of ten consecutive irradiations (200 MU each) for different dose rates).
Sensitivity
Linearity with dose (range 1-1000 cGy.)
Dose rate (range 52–1200 MU/min).

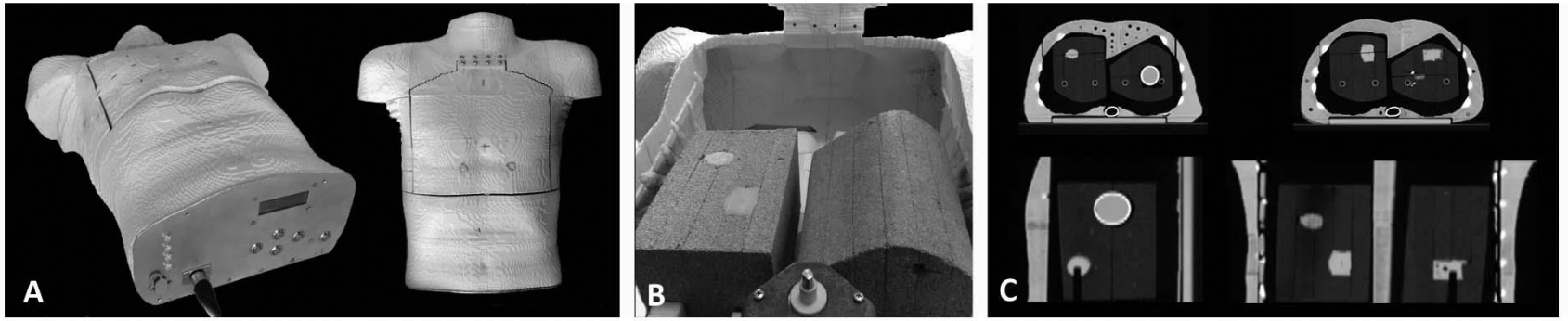
- In vivo dosimetry (TBI-TSET)





- Pre-treatment verification (point and dose distribution measurements)

CLINICAL APPLICATIONS



Pallotta S L, et al. ADAM phantom to test 4D medical imaging and dose delivery devices. Phys Med Biol 2019;64:105002.

ADAM (Anthropomorphic Dynamic breAthing Model)

CLINICAL APPLICATIONS

In phantom evaluation of targeting accuracy in MRI-based brain radiosurgery

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