

Saturday, June 30, 2018

10.00 - **Self-organised session 1**
16.30

Dosimetry in B fields workshop

Satellite symposium on

Standards and procedures for dosimetry and QA in MRgRT

Within the project “Metrology for MR guided radiotherapy” funded by the European Metrology Programme for Innovation and Research, standards and procedures for dosimetry and QA in Magnetic Resonance-guided radiotherapy (MRgRT) are being developed ([mrgrt-metrology](#)). Ongoing developments and preliminary results are presented at this dedicated one-day symposium. Researchers interested or working in this field are invited to participate and to discuss the current state of the art methods.

The day is divided in four blocks of the main “hot” topics in MR-guided-RT, which are covered by wonderful line-up of key-speakers. Don’t miss the opportunity to boost your MRgRT-dosimetry knowledge with this great overview.

Registration is open until the 31st of May. See below for further details. Updates on the program will be published on the website. Current draft of the program is as follows:

Reference dosimetry for MRgRT devices

Primary standards for kB - Leon de Prez (VSL, Netherlands)

Snap oral - Experimentally derived ion chamber magnetic field correction factors using a variable field on an in-line MR-linac -Jarrad Begg (South Western Sydney LHD, Australia)

kB from conventional linacs - Stefan Pojtinger (PTB, Germany)

kB using indirect methods – Alanine - Ilias Billas (NPL, United Kingdom)

kB using indirect methods – kbm/reading - Bram van Asselen (UMCU, Netherlands)

Fricke as secondary standard - Maria Trachsel (METAS, Switzerland)

Discussion: Towards a CoP for reference dosimetry - Jeroen vd Kamer (NKI-AVL, Netherlands)

Relative Dosimetry for MRgRT Treatment planning systems

Snap oral - The dose response of the PTW 60019 microDiamond in magnetic fields:

Characterisation for the Australian MRI-linac -Natalia Roberts (UOW, Australia)

Snap oral - The effect of rotation and tilt on the response of the Exradin A28MR

ionization chamber in a transverse magnetic field of 0.35T - Bhargesh Kandarp

Shukla (DKFZ, Germany)

Snap oral - Spectral characterization of plastic scintillation detector response as a

function of magnetic field strength - Eric Simiele (Univ of Wisconsin, USA)

Snap oral - Novel silicon dosimeters that measure dose in the build-up region and

penumbra of an MRI-linac - Peter Metcalfe (UOW, Australia)

Water tank measurements and detectors for MRI-Linac - Simon Woodings (UMCU, Netherlands)

Radiation field characteristics in B-fields - Ralf-Peter Kapsch (PTB, Germany)

Monte Carlo simulations in magnetic fields

Monte Carlo in the presence of magnetic fields - what's different - Hugo Bouchard (UdM, Canada)

Experimental benchmarking Monte Carlo based detector response simulations - David Shipley (NPL, United Kingdom)

Theoretical benchmarks for Monte Carlo based detector response simulations - Jacco de Pooter (VSL, Netherlands)

MC implementations for clinical purpose - Iwan Kawrakow (ViewRay, USA)

QA and workflow procedures for MRgRT

MRI QA - Marielle Philippens (UMCU, Netherlands)

Gel dosimetry - Christel Stien (CEA, France)

Snap oral - Heterogeneous and homogeneous 3D dosimeters for MR-IGRT systems - Hannah Lee (MDA, USA)

Film dosimetry - Daan Hofmans (VUMC, Netherlands)

Dosimetric effects of air cavities - Jane Shortall (Christie, United Kingdom)

Detectors for patient specific QA - Ian Hanson (RM, United Kingdom)

Antropomorphic phantoms To be determined (DKFZ, Germany)

Airborn electrons Sara Hackett (UMCU, Netherlands)

The satellite symposium is being held on June 30th, 2018 prior to the 6th MRinRT congress, between 10 am and 5 pm, at UMCU, Heidelberglaan 100, Utrecht.

To register please go to mrinrt-satelite-symposium. The deadline for registration is May 31. Advance registration for the meeting is required, but there is no fee.

For questions please contact:

Dr. Jacco de Pooter

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Open for additional self-organised sessions

16.30 - Welcome reception and tour through department
18.30

Sunday, July 1, 2018

10.30 -
11.00 **Registration, welcome**

Keynote lectures

11.00 - *Chair: Lagendijk*

12.15 *o Prof. Debus - Where do we go with online and real-time MRI guidance?*

o Prof Luijten - Developments in MRI

12.15 -
13.00 **Lunch**

13.00 - **proffered papers Clinical 1**

14.30 *Chair: Menard, Jingu*

Clinical experience from MRI-only radiotherapy – pearls and pitfalls

Persson

A two-year clinical experience with MR-only planning for prostate

N. Tyagi

Assessment of inter- and intrafraction displacement of individual axillary lymph nodes on MRI

Groot-Koerkamp

MR-guided high-dose-rate (HDR) brachytherapy or integrated volumetric arc therapy (VMAT) for intraprostatic dose escalation in localized prostate cancer

Chung

Focal treatment of locally recurrent prostate cancer with MRI-guided salvage high-dose-rate brachytherapy

van Son

Impact of repeated MR imaging for cervical cancer patients inside a combined brachy HDR and MRI treatment theatre

de Leeuw

Cine-MR based intra-fraction motion assessment for MR-Linac treatment of prostate cancer

de Muinck Keizer

Can pre brachytherapy MRI and deformable registration replace the MRI with applicator in place?

Craciunescu

Comparison of metabolic abnormality extension from MR spectroscopy with clinical target volume in glioma patients

Raschke

14.30 -
15.00 **Break**

15.00 - **proffered papers MRI guided Radiotherapy 1**

16.30 *Chair: Mutic, Low*

How would you plan for precise dose-painting of involved lymph nodes?

Rivera

Integrating a low-field open MR scanner with a static proton therapy research beamline: proof of concept.

Schellhammer

Implementation of a 4D MRI workflow for abdominal radiotherapy treatment planning.

Rai

Gastrointestinal 4D MRI with respiratory motion correction.

Johansson

Detection and characterisation of prostate cancer from multiparametric MRI using machine learning techniques for bio-focused radiotherapy.

Sun

Application of a deep convolutional neural network to segment the parotid glands on MR images.

Kieselmann

MR-only brain radiotherapy: Feasibility of dose calculation on synthetic CTs generated by a CycleGAN trained with unpaired data.

Dinkla

Development of a method to assess on-set treatment 3D positional verification for MR-only pathways.

Tyyger

16.30 -
16.45

Break

Industrial symposium gold sponsors

Chair: Raaymakers

16.45 -
18.30

o Viewray

o Elekta

o Philips

18.30 -
21.00

poster session and BBQ in garden at conference venue

Monday July 2, 2018

9.00 - **Symposium Deep learning**

10.00 *Chair: Fuller, Greer*

Deep learning in image processing for Radiology.
prof van Ginneken

Deep learning in image processing for Radiotherapy.
asoc. Prof van den Berg

10.05 - **proffered papers Clinical 2**

11.35 *Chair: Debus, Schultz*

Treatment response prediction using texture features from longitudinal diffusion MRI in sarcoma patients,
Gao

Can conventional MRI predict survival in pediatric ependymoma patients?
Tensaouti

Radiologic response on MRI and pathologic response after MR-guided single dose preoperative radiotherapy in breast cancer patients,
Vasmel

Prostate tumor prediction model for automated delineation QA on multiparametric MRI,
van Schie

Baseline dynamic R2* MRI in rectal cancer is associated with chemoradiotherapy outcome,
Roe Redalen

Clinical outcome after MRI guided (chemo-)radiotherapy for advanced cervical cancer; a single center experience,
Jurgenliemk-Schulz

Variability in Expert Delineation of Targets and Organs-at-Risk in Gliomas for CT-MRI and MRI-only workflows,
Tseng

MR-based target definition for laryngeal cancer; The overall results of 8 years of research at the UMC Utrecht,
Raaijmakers

11.35 -

11.50 **Short coffee break**

11.50 - **Panel discussion MR in RT**

12.30 *Chair: Debus, Lagendijk*

Members panel discussion: Slotman, Schulz, Fuller, Fallone

Will the MRI linac systems replace conebeamCT systems as standard RT system?

Will all MRI guided treatments become hypofractionated?

12.30 -

13.30 **Lunch**

13.30 - **proffered papers QA 1**

15.00 *Chair: Liney, Li*

Summary from the satellite symposium on Standards and procedures for dosimetry and QA in MRgRT, TBD

Geometric and dosimetric validation of 4D-MRI guided liver SBRT on the MR-linac.

van de Lindt

Dosimetric impact of MR geometric distortions – A study on head and neck cancers.

Adjeiwaah

Longitudinal measurements of multiparametric MRI: A phantom study.

Wang

Heterogeneous and homogeneous 3D dosimeters for MR-IGRT systems.

Lee

Surface dose measurements in an MR image-guided radiation therapy system using OSLDs: comparison with and without a static 0.35 T magnetic field.

Cammin

Commissioning of a 4D dynamic MRI motion phantom on a 3T MR scanner: motion validation study.

Schneider

Indication of accurate gold fiducial marker identification in a prostate MRI only radiotherapy workflow using C-Arm X-ray imaging.

Gustafsson

15.00 -

15.30

Break

15.30 -

17.00

proffered papers MRI

Chair: Thorwarth, Nyholm

Robust quantitative diffusion weighted MR on an MR-Linac system.

Schakel

Ultra fast image reconstruction for real-time MRI-guided radiotherapy by removing undersampling artefacts using deep learning.

Blokker

Feasibility of alternating repetition time balanced steady state free precession MRI on an MR-linac.

Gurney-Champion

Optimizing acquisition speed and contrast of respiratory correlated 4D-MRI on the 1.5T Unity MRI-linac.

Stemkens

Imaging performance of a dedicated radiation transparent RF coil on a 1.0 Tesla inline MRI-Linac.

Liney

Accelerating 3D head-and-neck MR imaging using convolutional neural network for MR-guided radiotherapy.

Zhou

Hybrid UTE/Dixon Acquisition for synthetic CT generation.

Wetscherek

Multi-Resolution radial MRI to Reduce IDLE time in pre-beam imaging on an MR-Linac (MR-RIDDLE).

Bruijnen

17.00 -

debate

17.45 *Chair: van der Heide, vd Voort v Zyp*

- The future of local prostate cancer care is non- invasive radiotherapy:

- o Against (pro-surgery): Henk vd Poel

- o For (pro-radiotherapy): Peter Hoskin

17.45- presentation by Bibian Mentel (Paralympic gold medallist) and young investigators
18.15 awards ceremony

Chair: Raaymakers

19.00 -
00.00

Conference dinner and party at Museum Speelklok, Steenweg 6, Utrecht

Tuesday July 3, 2018

09.00 - **proffered papers MRI guided Radiotherapy 2**

10.30 *Chair: Balter, Oelfke*

Characterizing MRI-guided tracking using the Elekta 1.5T MRI-linac system.
Glitzner

Tumour trailing on the MR-Linac: a first experimental proof-of-principle demonstration.

Fast

Motion model and super-resolution reconstruction from multi-slice MR image data using an MR-derived surrogate.

Eiben

Towards fast adaptive VMAT sequencing for the MRI-linac.

Kontaxis

Integrating a low-field open MR scanner with a static proton therapy research beamline: Characterisation of in-beam imaging performance.

Gantz

Towards real-time MR-guided high-dose-rate brachytherapy.

Beld

Tumor probability model for focal salvage strategies in recurrent prostate cancer patients after radiotherapy.

Fernandes

10.30 -

short coffee break

10.45

10.45 - **proffered papers QA 2**

12.15 *Chair: de Pooter, Ibbott*

Novel silicon dosimeters that measure dose in the build-up region and penumbra of an MRI-linac.

Metcalfe

Error estimation of slice chipping effects due to gradient non-linearity on the MR-Linac.

Borman

Dosimetric verification of Monte Carlo simulated effects of air cavities during MR guided Radiotherapy using EBT3 GafChromic film.

Shortall

Spiraling contaminant electrons increase doses to surfaces outside the photon beam of an MRI-linac with transverse magnetic field.

Hackett

Experimentally derived ion chamber magnetic field correction factors using a variable field on an in-line MR-linac.

Begg

Direct calorimetric measurement of ion chamber magnetic field correction factors, kB, in a 1.5 T B-field of an MRI-linac.

de Prez

Reference dosimetry in MRI-linac using alanine detector.

Billas

12.15- Proposals and voting next meeting and adjourn
12.30 *Chair: Lagendijk*