Contribution ID: **32** Type: **Poster**

Paving the way towards gamma-MRI

A 2016 publication in Nature [1] presented a proof of principle experiment for a new method of medical imaging. The new technique uses many elements of traditional Magnetic Resonant Imaging (MRI), but replaces the measurement of RF signals from 1H nuclei with the detection of anisotropic gamma-emission from a hyperpolarized radioactive tracer, in this case 131mXe.
Since gamma-radiation is far easier to detect than RF-photons, this method is sensitive to sample concentrations that are orders of magnitudes lower than those needed for conventional MRI. Therefore, it has the perspective of combining the advantages of nuclear tracers, as they are used in SPECT for their selective chemical properties, with the much higher spatial resolution of MRI.
The method as presented in Nature has only been realized with a relatively low-resolution 2d-projection image in gas phase, recorded over many hours.
We have therefore created a collaboration to further develop the method towards a new medical imaging modality. In this poster, we present the planned configuration of our first setup, as well as the imaging algorithm and simulation results for the upcoming experiments.

[1]: Y. Zheng et al, Nature, 537 (2016) 652-655

Primary author: ENGEL, Robin Yoel (Universitaet Oldenburg (DE))

Co-authors: KOWALSKA, Magdalena (CERN); Dr HYACINTHE, Jean-Noël (Radiology Clinic, Geneva University Hospital and Faculty of Medicine, University of Geneva); PALLADA, Stavroula (CERN); Prof. NEU, Walter (Faculty of Technology, Department of Natural Sciences, Photonics, University of Applied Sciences, Fachhochschule Oldenburg/Ostfriesland/Wilhelmshaven, Emden, Germany); KULESZ, Karolina (Warsaw University of Technology (PL)); STORA, Thierry (CERN); Prof. JOLIVET, Renaud Blaise (CERN and University of Geneva)

Presenter: ENGEL, Robin Yoel (Universitaet Oldenburg (DE))

Session Classification: Poster Session