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Introduction Medical Imaging and PET

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Positron Emission Tomography (PET) imaging constitutes the molecular imaging technique of excellence and is used to evaluate a radio-tracer uptake by an organ or lesion. PET imaging is used in both the clinical (humans) and preclinical (small animal) fields. PET is often combined with other imaging modalities such as Magnetic Resonance Imaging (MRI) or Computed Tomography (CT) to provide both anatomical and functional information and thus, enhaced diagnostics.
The performance requirements for clinical and preclinical PET systems are different since the sizes of the structures to be observed as well as the targeted information provided by the PET images varies from one collective to the other.
In these talks, we will review the mechanical aspects (size, geometry, electronics⋯) to be considered and main performance parameters in terms of 3D Spatial, Energy and Temporal resolution in clinical and preclinical PET systems. Moreover, a revision of the state-of-the-art PET technology and future trends is provided. A short introduction to X-ray, CT and MRI techniques will be also outlined.

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