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# Development and Evaluation of a Portable MVT-based All-Digital Helmet PET Scanner

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## #SYSTEM

### ARCHITECTURE

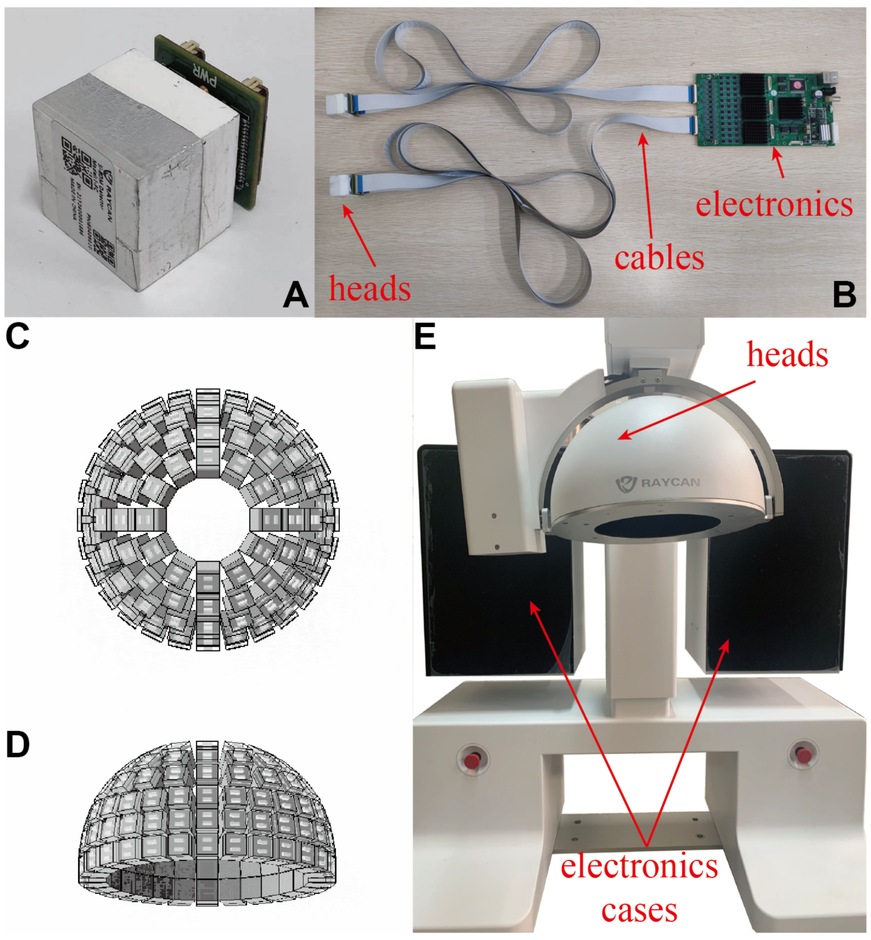


Fig. 1. MVT-based All-Digital helmet PET system. A PET head is composed of a 6×6 array of LySO crystals read out by an array of 6×6 SiPMs (A). A detector unit consists of 2 PET heads (B). 130 heads are arranged in a hemispherical shape, with an axial and transaxial FOV of 124 mm and 200 mm, respectively (C,D), mounted on a movable structure (E)

### PERFORMANCES

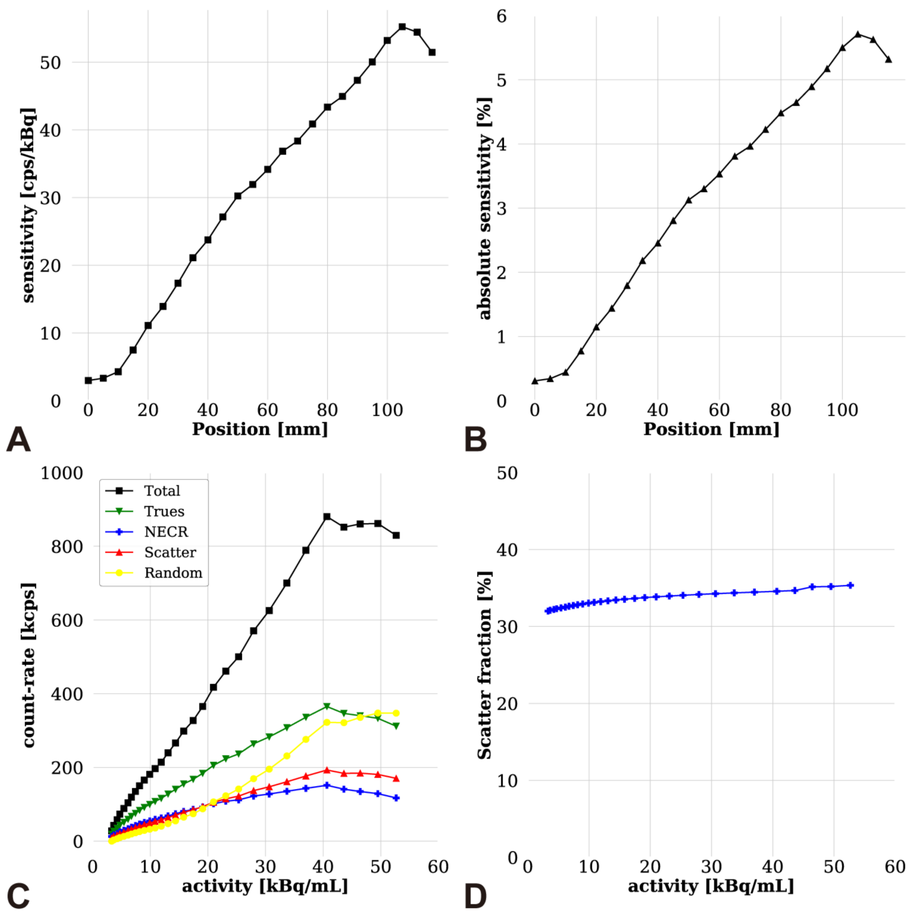


Fig. 2. MVT-based All-Digital helmet PET system performances: sensitivity evaluated with a point-like source (A), absolute sensitivity (B), count rate capability evaluated with a capillary tube of 3.2 mm drilled into a polyethylene monkey phantom where a [18F]-FDG solution is injected (C), dependence of scatter fraction (D) on activity

## #IMAGING

### DERENZO

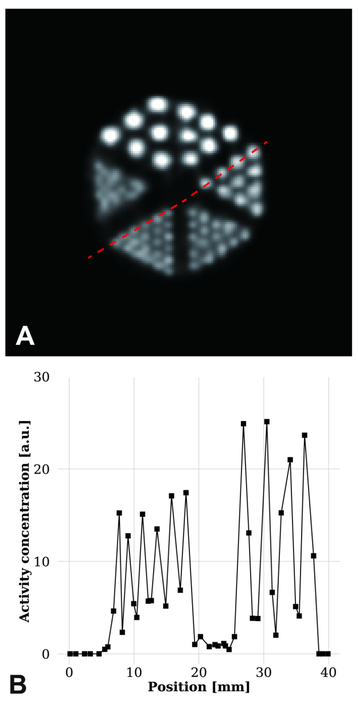


Fig. 3. Spatial resolution 2 mm (A), intensity profile along the red line (B)

### DYNAMIC SCAN

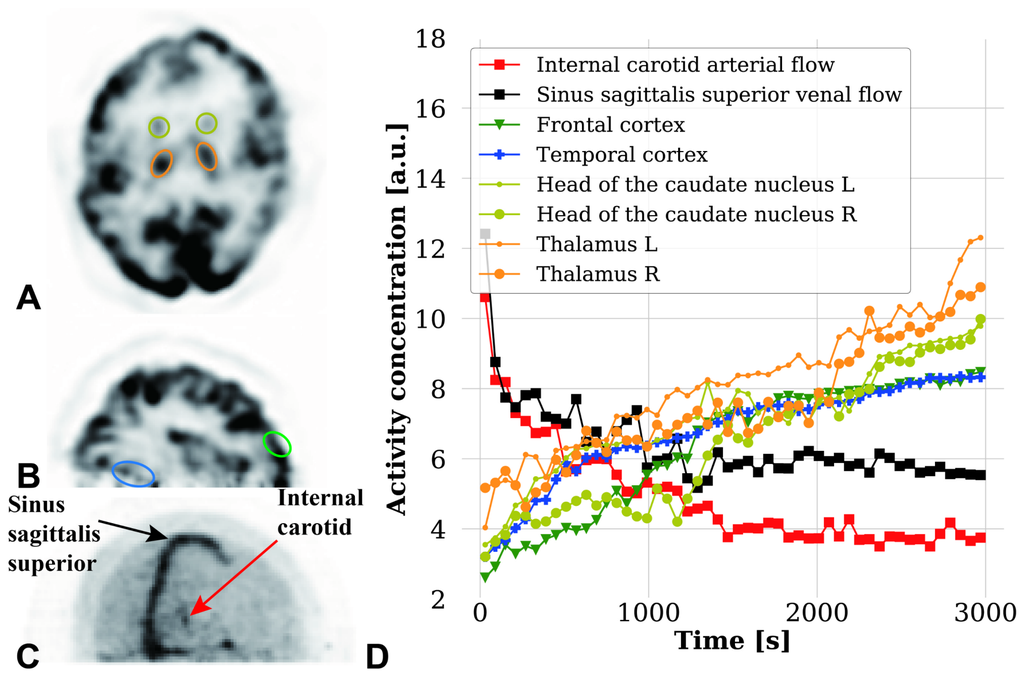


Fig. 4. MVT-based All-Digital helmet PET system brain imaging performance with [18F]-FDG: selection of the volumes of interest (A,B,C), and Time-Activity Curves of the tracer uptake (D)

### AMYLOID SCAN

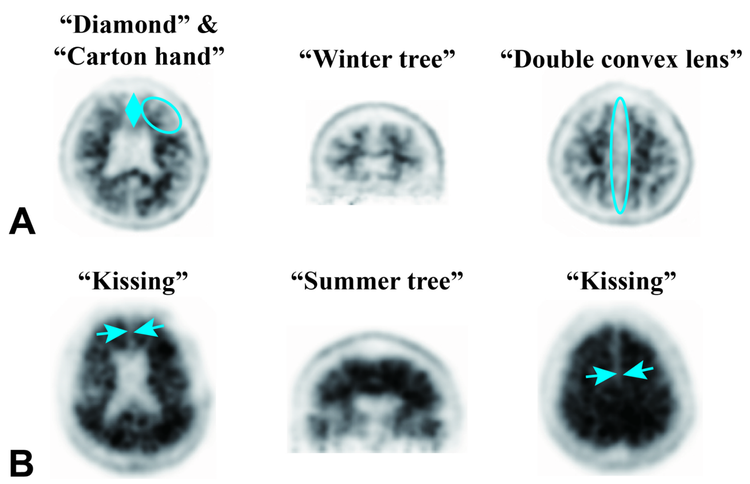


Fig. 5. MVT-based All-Digital helmet PET system brain imaging performance with [18F]-Florbetapir: negative-image signs in the brain image of a 67-years-old patient (A), positive-image signs in the brain image of a 68-years-old patient (B)

References:

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