

**IEEE Transactions on Radiation & Plasma Medical Sciences
Special Issue on**

Parametric Imaging for Clinical Applications

Call for Papers

Guest Editors: Guobao Wang, Arman Rahmim, Roger N. Gunn

Parametric imaging involves moving beyond standardized uptake value (SUV) images as widely used in the clinic. It can provide images of physiologically important parameters using dynamic scanning and voxel-wise tracer kinetic modeling, with advantages of being quantitative and multiparametric as compared with semi-quantitative SUV images. Other kinds of parametric imaging are also possible, such as voxel-wise statistical maps summarizing dynamics of radiotracer uptake (using non-kinetic modeling methods), or voxel-wise images of texture/radiomic features. While parametric imaging has witnessed extensive research, applications in the clinic have been hampered due to limitations such as high noise of dynamic data, the requirement for longer acquisitions, lack of whole-body implementations, or limited demonstration of clinical significance beyond SUV. In recent years, several important technical progresses have been made in both algorithms and instrumentation. Examples include direct reconstruction of parametric images from raw data, implementation of whole-body parametric imaging on commercial PET scanners, time-of-flight PET data acquisition, and the recent advent of long axial field-of-view PET scanners (e.g., EXPLORER, Penn PET Explorer) enabling unprecedented sensitivity and simultaneous dynamic imaging of multiple organs. The field of radiomics has also been primarily limited to region-of-interest analyses, and voxel-based applications have been less common. Given these advances and opportunities, it is appropriate and timely to consider renewing our interests in parametric imaging to promote broader scientific research and clinical applications.

In this special issue, we invite scientists to submit papers on methodological developments and clinical applications of parametric imaging. We hope to provide a dedicated forum for interested researchers to review past achievements, report recent progresses, and discuss remaining challenges and future directions. The topics include, but are not limited to:

- Approaches and algorithms for tracer kinetic modeling and parametric imaging for individual organs and total body, including evaluation and optimization of image reconstruction for kinetic modeling and parametric imaging
- Techniques for parametric image generation using non-kinetic modeling methods or involving texture/radiomic features
- Multiparametric imaging using single-tracer, dual-tracer or multimodality (e.g., PET/MR and PET/CT) methods
- Emerging and novel clinical applications of single-organ (e.g., heart, brain, liver, lung), multi-organ interaction (e.g. brain-gut axis), and total-body parametric imaging
- Deep learning for kinetic modeling and parametric imaging

Authors must submit papers digitally to <https://mc.manuscriptcentral.com/trpms>, using standard IEEE Transactions format, indicating in their cover letter that the submission is aimed for this special issue. Authors are encouraged to contact the guest editors to determine suitability of their submission for this special issue.

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Schedule:

Submission of manuscripts: November 30, 2019
Acceptance/rejection notification: February 1, 2020
Revised manuscripts due: April 1, 2020
Publication: July 2020 (Tentative)