

AbstractID: 14552 Title: Compressed Sensing as Applied to Computed Tomography

There have been significant advances in algorithm development for image reconstruction in cone-beam computed tomography (CBCT) in recent years. The newly developed algorithms not only are likely to impact on the existing CBCT systems and imaging protocols but also, more importantly, allow the design and establishment of innovative, emerging CBCT imaging approaches and applications. The presentation will focus on discussing some of these algorithms and illustrating their potential implications for CT applications by using diagnosis and radiotherapy imaging examples. Emphasis will be placed on identifying and clarifying a number of issues, such as the relationship between the Nyquist sampling theorem and compressive sensing approach, which seem to be confusing. Evaluation of algorithm performance will also be a focus of discussion in the presentation. It will be explained that the “mathematic exactness” of an algorithm could be an irrelevant metric for meaningfully assessing the algorithm’s utility in its practical applications, followed by discussion of potential methods for carrying out a performance evaluation of algorithms in CBCT.