

**MEETING ON TOMOGRAPHY AND  
APPLICATIONS  
MATHEMATICS DEPARTMENT, POLITECNICO DI MILANO  
MARCH 21-23, 2016**

**Dynamic sparse X-ray tomography**

**ABSTRACT** In recent years, mathematical methods have enabled three-dimensional medical X-ray imaging using much lower radiation dose than before. One example of products based on such approach is the 3D dental X-ray imaging device called VT, manufactured by Palodex Group. The idea is to collect fewer projection images than traditional computerized tomography machines and then use advanced mathematics to reconstruct the tissue from such incomplete data. The idea can be taken further by placing several pairs of X-ray source and detector “filming” the target from many directions at the same time. This allows in principle recovering the three-dimensional inner structure as a function of time. From the biological point of view, one could observe the internal organs of a living and un-sedated organism such as a laboratory mouse. Tentative computational results are shown, based on both simulated and measured data. The results suggest that the new imaging modality is promising for biological applications.

**Samuli Siltanen**, University of Helsinki