

**MEETING ON TOMOGRAPHY AND  
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**BOOK OF ABSTRACTS**

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**Regridding for efficient tomographic reconstruction algorithms**

**ABSTRACT** At third generation synchrotron sources, typical acquisition times range from few minutes for high-resolution tomographic datasets to just few hundreds of milliseconds in time resolved experiments (e.g. 20 Hz tomography). To efficiently reconstruct this large amount of data (on the order of several tens of TBs per experiment) without need for dedicated GPU hardware, we exploit regridding, guaranteeing high computational performance without loss in accuracy. In this talk we first introduce the basics of projectors based on regridding also highlighting their versatility, and then discuss their application both in analytic and iterative reconstruction algorithms. We show that the projector accuracy in iterative schemes does not influence the algorithm convergence and the final reconstruction quality. The speed increase provided by these operators compared to other state-of-the art approaches is at least of one order of magnitude while the memory requirements remain moderate. These latest algorithmic developments make iterative approaches very attractive to tackle the reconstruction of strongly under-constrained datasets, typical in emerging 4D studies and bring real-time 3D previewing of time-resolved experiments closer to reality.