SXSP: SLAC X-ray Signal Processors

Angelo Dragone
SLAC- Stanford University

With the birth of LCLS, SLAC has been involved in the design of novel high frame rate X-ray cameras to cover the wide range of requirements of the experiments. Cameras have been developed using a platform approach around a family of ASIC analog signal processors (SXSP) with a standard communication protocol. Three categories of ASICs and Pixel Array Detectors have been developed: one that measure energies (ePix) for imaging or spectroscopy, one that measure timing (tPix) for time of flight applications and one that counts (cPix) for photon counting applications. Each category has several variants. This presentation will review the architecture of the first generation of cameras and their functionalities together with an overview of the upgrades and the new variants planned to increase the frame rates and exploit the new opportunities at the upcoming LCLS-II. Although the majority of the cameras are tailored for synchronous applications at FELs, they can be also useful at synchrotrons; the potentials and limitations will be discussed. To complete the overview of detectors developed at SLAC few details on the novel TES detectors will be presented.