Real Time Imaging with the Allen Telescope Array

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Abstract

We present the design of an automated real-time imaging system (ARTIS) for the Allen Telescope Array (ATA). The need for data calibration and excision of radio frequency interference (RFI) and systematic errors presents a challenge in radio astronomy synthesis imaging. These challenges are especially pertinent to large-number small-diameter (LNSD) arrays, which rely heavily on data processing to produce images with high fidelity and dynamic range. ARTIS processing is capable of performing data editing, calibration and imaging in close to real time with both limited or extensive a priori knowledge of the sky brightness distribution.