LOFAR International Single Station Metadata Definition

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Abstract

This is a technical description of the metadata format defined for use with LOFAR international single station data products including: total correlation matrices (ACC), beamlet statistics (BST), subband statistics (SST), and single subband correlation matrices (XST). A python module (`issformat`) has been written which implements this definition.

1 Introduction

2 Metadata Key Definitions

2.1 Generic Keys

- **Station:** station string, 5 characters, e.g. SE607, UK608, IE613, ...
- **RCUmode:** mode of each RCU, valid values: 1-7. If only one entry is used then it is assumed all RCUs are the same mode. Otherwise, an entry for each RCU is required.
- **Timestamp:** date and time of the file.
- **HBAElements:** optional, when using the HBA in a non-standard mode by disabling elements in the tile, e.g. HBA 'All-sky' mode, then this key is used to store the setup of each tile. A tile state is encoded in a 4-digit hexidecimal string. Each hexidecimal character represents a row of the tile.
- **Special:** Extra entry to include comments for the observation.

2.2 Total Correlation (ACC) Keys

- **Integration:** correlation integration length in seconds, default: 1.

2.3 Beamlet Statistics (BST) Keys

- **Integration:** correlation integration length in seconds.
- **Bitmode:** beamlet bit mode, 16, 8, or 4 bit resulting in 244, 488, 976 possible beamlets respectively.

- **Pol:** polarization of beamlet, X or Y.
- **beamlets:**
  - **ID:** beamlet ID number
  - **Pointing:** pointing in given coordinate system (theta, phi, coord).
  - **Subband:** subband ID.
  - **RCUs:** RCUs in the beamlet.

2.4 Subband Statistics (SST) Keys

- **RCU:** RCU ID.

2.5 Subband Correlation (XST) Keys

- **Integration:** correlation integration length in seconds.
- **Subband:** subband ID.

3 Examples

4 `issformat` use