OSKAR Pointing File

1 Introduction

It may be necessary to simulate arrays where each station (and/or sub-station, if using hierarchical beamforming schemes) has a different phase centre. The pointing file described in this document provides the means to do this.

2 File Format

The pointing file is a plain-text file that can be used to specify the direction of the beamformed phase centre for every (sub-) station in the array. It is an optional file: if it is not specified, all station beams will point in the direction of the interferometer phase centre, as defined in the main settings file.

Each row in the file is used to define a beam direction. The text file has a variable number of columns per row, which specify the address of the station(s) in the hierarchy (via multiple indices) and the beam direction to set for the station(s). The columns are:

- The index of the top-level station.
- The index of the station (or tile) at the next level down, if required.
- ... (and so on, for further sub-stations, if required).
- The coordinate system used for the beam specification. This is a string that may be either AZEL or RADEC to specify horizontal or equatorial coordinates.
- The longitude of the beam in degrees.
- The latitude of the beam in degrees.

Wildcards (an asterisk, $*$) may be used in the index columns to allow the same direction for all stations of the specified parent station.

An entry in the file will set the beam direction for the station(s) at the last specified index, and recursively for all child stations.

Note also that the order in which lines appear in the file is important. Entries that appear later override those that appear earlier.

2.1 Example

For example, a file may contain the following lines to specify different phase centres for beams formed at the tile and station levels:

```
*   RADEC 45.0 60.0 # All stations (and children) track (RA, Dec) = (45, 60).
3   RADEC 45.1 59.9 # Station 3 (and children) tracks (RA, Dec) = (45.1, 59.9).
* * AZEL  60.0 75.0 # All tiles in all stations have fixed beams.
0 * AZEL  60.1 75.0 # All tiles in station 0 are offset from the rest.
2 6 AZEL   0.0 90.0 # Tile 6 in station 2 is pointing at the zenith.
```

Revision History

Revision	Date	Modification
1	2013-03-01	[2.2.0] Creation.