Solar360 Mobile Energy

Coordinate systems for solar image data

Overview

This document outlines the various possible coordinate systems which may be used for solar image data, and to show how these coordinate systems re-late to the World Coordinate System (WCS) formalism used in FITS files.What are coordinate systems for solar image data?

Coordinate Systems for Solar Image Data, Thompson, W., Astronomy & Astrophysics, 449, 791, 2006 - a proposed set of formal systems for describing the coordinates of solar image data, including heliographic and heliocentric coordinates. A proposal by Steve Allen and Jessica Mink for concatenating WCS keywords.

What is the current state of describing the coordinates of solar image data?

The current state of describing the coordinates of solar image data is chaotic, and does not take into account the most recent developments in the coordinate systems for astronomy in general, especially as related to FITS files. A set of formal systems for describing the coordinates of solar image data is proposed.

Do solar image coordinates exist?

Although there is widespread agreement on the coordinate systems to be used for interplanetary space (Russell, 1971; Hapgood, 1992), no formal structure exists for solar image coordinates, except for the wellestablished heliographic coordinate system.

What is a coordinate system in solar observation & imaging?

In solar observation and imaging, coordinate systems are used to identify and communicate locations on and around the Sun. The Sun is made of plasma, so there are no permanent demarcated points that can be referenced. The Sun is a rotating sphere of plasma at the center of the Solar System.

How should new solar data be written?

We recommend that new solar data be written using the World Coordinate System formalism discussed here. The simplest of the WCS-compliant coordinate systems is the helioprojective-cartesian system in the TAN projection, and is also the best match to current practice for many observatories.

What is the relationship between solar imaging coordi-Nate systems and Space Physics?

The simplest relationship between the solar imaging coordi-nate systems discussed above and the coordinate systems used in space physics is that between Heliocentric Cartesian co-ordinates and Heliocentric Earth Equatorial (HEEQ) coordi-nates (Hapgood 1992).

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GOES-16 SUVI Level 1b (L1b) Data Release Full Validation ...

SUVI data consist of solar images is six extreme-ultraviolet passbands -- 94 Å, 131 Å, 171 Å, 195 Å, 284 Å, and 304 Å -- with a variety of exposure times and filters in place to ensure each ...

[2.105] Standardized Coordinate Systems for Solar Image Data

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The latter allows for much more flexibility in the types of coordinate systems which can be expressed, as well as in describing how the instrument coordinate axes map into real-world coordinates. For those reasons, we will concentrate on the ...

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