JX-ISAS-SUZAKU-MEMO-2014-01
Title: Preliminary prediction for sun angle limits during the AO9 phase
Category: Common
Author: Y. Maeda et al.
Date: 2014-06-30

Preliminary prediction for sun angle limits during the AO9 phase

Yoshitomo Maeda, Chris Baluta, Noriko Yamasaki, Tadayasu Dotani, Satoru Katsuda, Motohide Kokubun, and the Suzaku operation team
e-mail:ymaeda@astro.isas.jaxa.jp

June 25, 2014

1 Overview

Due to the recent decay of the electric power supply from the solar paddles there are now extended periods of time during which the HXD and XIS can not be operated together. Both sets of detectors may be used only during those periods for which the satellite has a high day-to-night ratio. We summarize here a prediction of possible times for which the HXD may be turned on. The predictions cover the period from July 2014 to the end of the AO9 phase (March 31st, 2015).

The prediction is based on a preliminary equation which estimates the power balance of Suzaku. The date given above will be updated in future.

2 Prediction of the HXD+3XIS-on

Using the recent orbital elements of the Suzaku satellite, the night-to-day ratio for the remainder of the AO9 phase was calculated. Taking into account the charging of the satellite battery during satellite–day and the discharge during satellite–night, the maximum allowable sun-angle for a given day is calculated. These calculations are plotted in Figure 1. Unfortunately, the solar paddles of Suzaku can not always provide enough electricity to the bus. Only during the four durations given in Table 1 can we turn the full suite of instruments (the HXD + 3XIS detectors).

Figure 1 also shows the sun angle constraint for the cases during which the HXD is turned off. Observations in this case may be made with a sun angle of $\sim$15 degrees or larger.

Table 1: Preliminary duration of the 3-XIS and HXD detectors in co-operation

Duration	Start	Stop
1	2014.07.26	2014.08.10
2	2014.10.11	2014.10.24
3	2014.11.26	2014.12.14
4	2015.01.14	2015.01.30

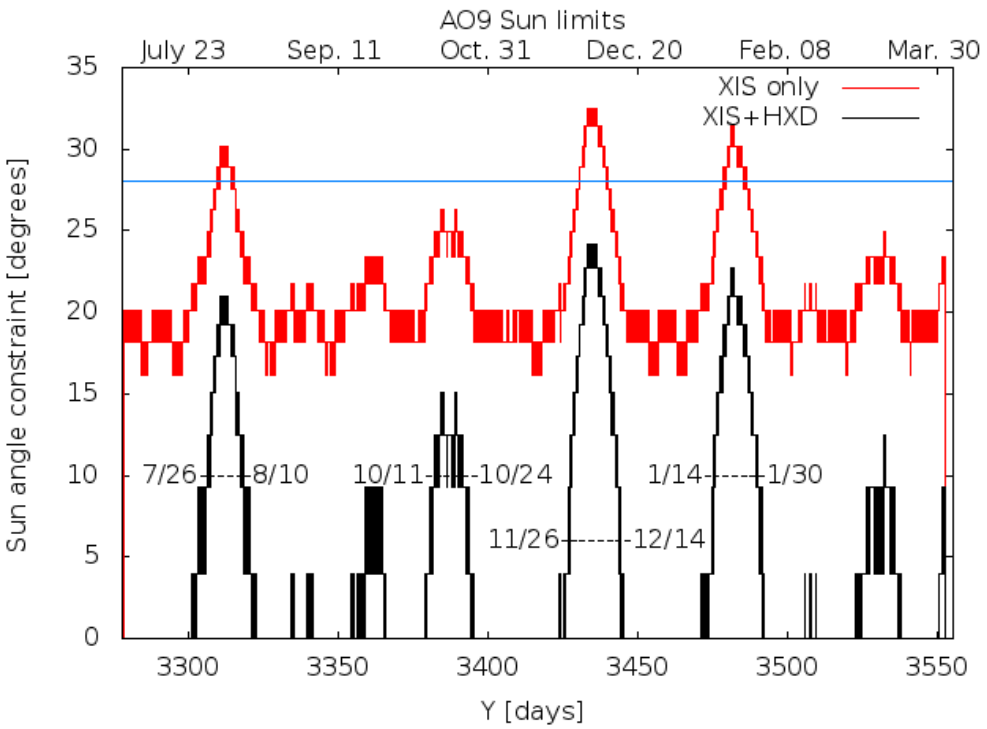

Figure 1: Sun angle constraint for the AO9 phase. The black line corresponds to the case that all the instruments HXD and XIS-0, -1, -3 are turned on. The red line corresponds to the case of no HXD. Days with a large allowed sun-angle correspond to times of a favorable (large) day-to-night ratio. The blue line corresponds to the maximum allowable sun-angle which avoids the illumination to the X-ray telescopes (XRT-Is) .