

# New Horizons Kuiper Belt Extended Mission: Alice Ultraviolet Imaging Spectrograph Scans of Lyman-alpha Emission from the Interplanetary Medium – Overview

This data set contains scans of Lyman-alpha emission from neutral hydrogen in the interplanetary medium obtained by the New Horizons Alice Ultraviolet Imaging Spectrograph.

This dataset provides 135155 measurements of the total instrument count rate at 1 second cadence. Each measurement lists the Mission Elapsed Time (MET, in seconds of time from the New Horizons launch on January 19, 2006) and the total analog count rate observed by the Alice instrument. That count rate includes instrumental background counts, which primarily are from the radioisotope thermoelectric generator (RTG) and stimulated pixels, and have a typical level of 120 counts/s. The sky UV brightness is highly dominated by solar Lyman-alpha emission that is scattered by interstellar hydrogen atoms passing through the solar system, so the counts above the instrumental background in this dataset are assumed to be due to Lyman-alpha except for the notable spikes of brightness whenever stars pass through the slit. The Alice sensitivity to diffuse Lyman-alpha emissions is  $S = 4.92 \pm 0.09$  counts/s/R (where  $1 \text{ R} = 1 \text{ Rayleigh} = 10^6 \text{ photons/cm}^2/\text{s}/4 \pi \text{ steradian}$ ), so to convert count rates to brightness, one would subtract 120 from the value and divide the remainder by 4.92 to get a brightness in units of Rayleighs.

Also provided for each measurement are the 44 right ascensions and 44 declinations of the rows of the Alice slit on the sky, in units of decimal degrees, using definitions provided in the SPICE Alice instrument kernel (nh\_alice\_v200.ti). For each case, SPICE is used to calculate the RA/Dec for Alice row corners at 1 second cadence. For all cases, for METs where the count rate is not available or cannot be inferred, its value is set to -1.

A full description of the processing and analysis of these data can be found in Gladstone, et al. (2018).

## References

Gladstone, G. R., et al., The Lyman-alpha Sky Background as Observed by New Horizons, *Geophysical Research Letters*, 45, 8022-8028, doi: 10.1029/2018GL078808, 2018.