

# Aerosol information from Met Imagers: AHI (Himawari-8/9) Overview

**Taichu Y. Tanaka**

**Meteorological Research Institute, Japan Meteorological Agency**

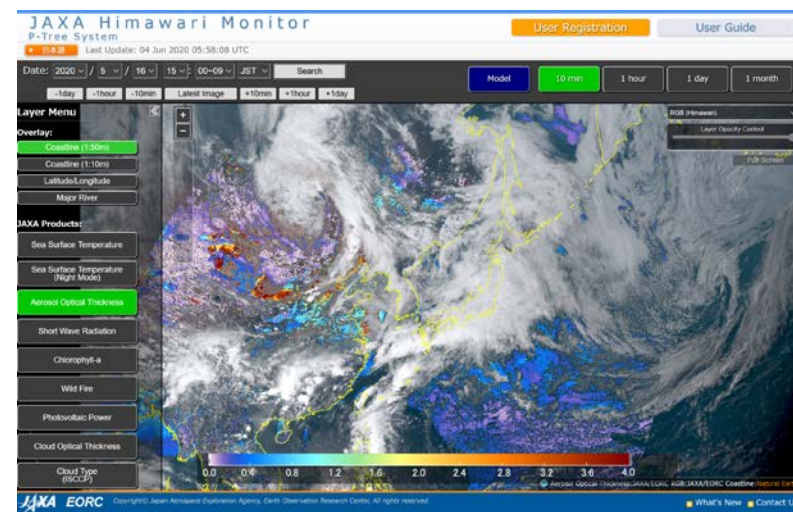
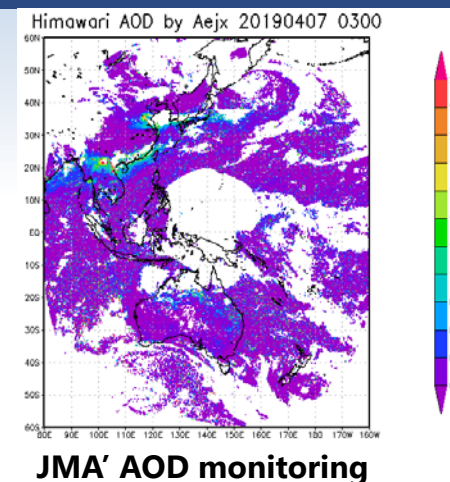
11 June 2020

CEOS AC-VC-16



# Himawari-8 Aerosol products

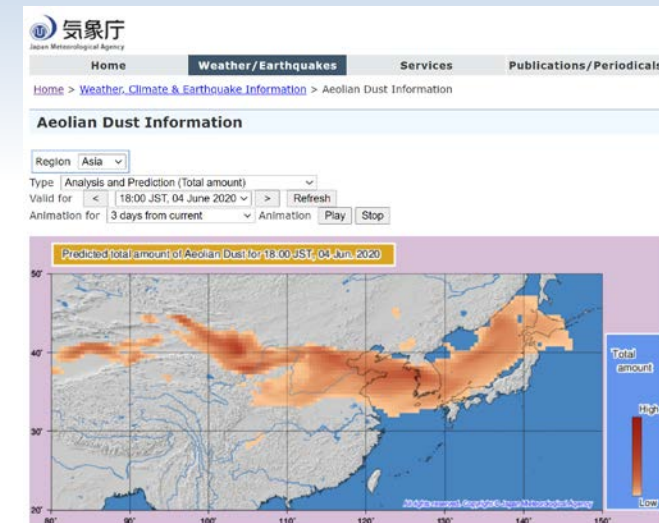
- JMA
  - Aerosol Optical Depth, Angstrom exponent
    - LUT: Assumption: dust aerosol
  - Dust RGB composite
  - Volcanic ash
- JAXA EORC Himawari Monitor Aerosol property
  - AOT, Angstrom exponent, their uncertainties and QA flags
  - Level-2: 10-minute interval (current version: 2.1)
  - Level-3: 1-hour, 1-day and 1-month merged product (current version: 3.0) ([Kikuchi et al. 2018](#); [doi:10.1109/TGRS.2018.2800060](https://doi.org/10.1109/TGRS.2018.2800060))
  - Common algorithm to retrieve aerosol properties for various satellite sensors ([Yoshida et al. 2018](#), [doi:10.2151/jmsj.2018-039](https://doi.org/10.2151/jmsj.2018-039))



**JAXA Himawari Monitor** <https://www.eorc.jaxa.jp/ptree/>  
You can register and get the netCDF data.

# Applications and Researches

- JAXA EORC provides its AHI aerosol products (including data assimilated analysis) via “**JAXA Himawari Monitor**” website <https://www.eorc.jaxa.jp/ptree/>.
- JMA is using JAXA’s AHI AOT algorithm for its **operational aerosol data assimilation for the aeolian dust forecast** from 29 Jan. 2020. <https://www.data.jma.go.jp/gmd/env/kosa/>
- **JAXA, JMA,** and **Kyushu University** have been collaborating for the aerosol retrieval, forecasting, and data assimilation.
- Recent study: we are testing to use the predicted aerosol distribution as the first guess of the aerosol retrieval (discussion paper: [Yoshida et al. doi:10.5194/acp-2020-356](https://doi.org/10.5194/acp-2020-356))
- Diurnal variation is still a problem.



**JMA's Aeolian Dust Information website**  
[https://www.data.jma.go.jp/gmd/env/kosa/fcst/en/fcst-c\\_as.html](https://www.data.jma.go.jp/gmd/env/kosa/fcst/en/fcst-c_as.html)

The screenshot shows the Atmospheric Chemistry and Physics journal article page. The title is "Retrieval of Aerosol Combined with Assimilated Forecast". The authors are Hayumi Yoshida<sup>1</sup>, Koji Yumimoto<sup>2</sup>, Takashi H. Nagao<sup>3</sup>, Taichu Tanaka<sup>4</sup>, Maki Kikuchi<sup>5</sup>, and Hiroshi Murakami<sup>6</sup>. The article is dated 27 May 2020. The abstract states: "We developed a new aerosol retrieval algorithm combining a numerical aerosol forecast. In the retrieval algorithm, the short-term forecast from an aerosol data assimilation system was used for a priori estimate instead of spatially and temporally constant values. This method was demonstrated using the Advanced Himawari Imager onboard the Japan Meteorological Agency's geostationary satellite Himawari-8, and the results showed spatially finer distributions than the model forecast and less noisy distributions than the original algorithm. We validated the new algorithm using ground observation data and found that the aerosol parameters detectable by satellite sensors were retrieved more accurately than a priori model forecast by adding satellite information. Moreover, the retrieval accuracy was improved by using the model forecast as compared with using constant a priori estimates. By using the assimilated forecast for a priori estimate, information from previous observations can be propagated to future retrievals, thereby leading to better retrieval accuracy. Observational information from the satellite and aerosol transport by the model is incorporated cyclically to effectively estimate the optimum field of aerosol." The article is available under a Creative Commons Attribution 4.0 license.

[Combination of Aerosol retrieval and forecast. doi:10.5194/acp-2020-356](https://doi.org/10.5194/acp-2020-356)