

A short report of news in the IAU Meteor Data Center in 2024

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Abstract. During 2023, the IAU Meteor Data Center team went on an effort to upgrade the databases which it maintains and improved its web site. In this short report, the activities of the team are briefly described.

1. Introduction

The IAU Meteor Data Center (MDC) is a central repository of the orbital and other data of individual meteors (MO part of the MDC) and the official database of known meteor showers (SD part). During 2024, the MDC team continued to innovate the data and improve the web site providing them.

2. Work of the Meteor-Orbit part

The MDC team of the MO part added the set of the data collected by the SonotaCo team during the previous year, 2023; version 2024 was released. This version contains: 6 345 photographic meteors, 962 773 video meteors, and 11 057 023 radio meteors. The database of video meteors consists of 471 582 records published by the Cameras for Allsky Meteor Surveillance (CAMS) group (Gural, 2011; Jenniskens et al., 2011, 2016a,b; Jenniskens & Nénon, 2016; Jenniskens et al., 2016c), 490 283 records by the SonotaCo group (SonotaCo, 2009, 2016, 2017; SonotaCo et al., 2021), and 908 records by the Dutch Meteor Society (DMS) (<https://dmsweb.home.xs4all.nl/index.html>). The database of radio meteors consists of the sample of 8 916 meteors observed at the Hissar observatory, Tajikistan, (Narziev & Chebotarev, 2019; Narziev et al., 2020) and 11 048 107 records by the Southern Argentina Agile Meteor Radar (SAAMER) team (Janches et al., 2020; Bruzzone et al., 2020).

3. Work of the Shower-Database part

The MDC team of the SD part worked to improve the classification of showers in the MDC list. (Jopek et al., 2024; Neslušan et al., 2024; Ďurišová et al., 2024). This work was a continuation of the previous effort of the MDC team. (Neslušan et al., 2020; Rudawska et al., 2021; Hajduková et al., 2023; Jopek et al., 2023; Neslušan et al., 2023). It is well-known that the characteristics of some showers in the list were determined by more than a single author team. The set of the characteristics published by one author team is referred as “solution” of shower. When a new shower is found in a meteor database, the author must answer the question whether this shower is the first solution of a new, not-yet known shower or whether it is another solution of an already known shower. After authors do the classification of their showers, then they can submit them to the MDC. Newly discovered showers receive a preliminary designation based on the new nomenclature rules (Jopek et al., 2023) and are added to the Working List. New sets of parameters for known meteor showers are added under the shower’s appropriate designation in either the Working List or the List of Established Showers, depending on the status of the shower.

The classification has always been done by the authors using their own criteria, which sometimes differed considerably. This caused that some solutions of already known showers were classified as the newly discovered, autonomous showers or the really autonomous showers became the solutions of known showers and did not obtain a new name. The MDC team searches for the unique criteria to correctly classify the newly found showers, as well as showers already on the MDC list. The search is not over, yet. It will go on in a collaboration with the Working Group on Meteor Shower Nomenclature. (https://www.iau.org/science/scientific_bodies/working_groups/276/)

Astronomers who observe meteors and collect meteor databases can significantly contribute to the correct classification of the showers in the list, when they post to the MDC not only the newly discovered showers, but also the new solutions of already known showers. If there are several independent solutions for a given shower, its reliability is proved much better than a shower with only a single solution.

The MDC team also searched for the parent bodies of the meteor showers. They discovered 81 new associations between the showers and comets. As part of this research, 84 already known associations were confirmed (Ďurišová *et al.*, 2024). Besides this study, a comprehensive search for the parent bodies in the literature was performed. Based on these results, a new list of the parent bodies will be created and the web pages will be upgraded with this information.

4. New web pages

In 2024, the MDC team of the SD part created the new, BETA, version of the web pages that provide the list of showers. Users of these pages can utilize some new services such as extracting a list of currently active showers, selection of the showers within the defined intervals of parameters, calculation of the similarity of mean orbits of showers (using the D functions) or check the internal consistency between the geocentric and orbital parameters of shower.

5. Availability and future plans

We recall the URL of the MDC web site, title page: <https://www.iaumeteordatacenter.org/>

and, directly, to the MO part: <https://ceres.ta3.sk/iaumdcdb/>

or SD part: <https://www.ta3.sk/IAUC22DB/MDC2022/>

eventually to the BETA version of SD part: <https://ceresiaumdc.ta3.sk/>

All the content of this site is public-domain. Although many catalogs (CAMS, SonotaCo, DMS, GMN,...) can be downloaded from the native web pages of the groups performing the meteor observation and data collection, the catalogs mirrored at the MDC can be downloaded in uniform format and their version (exact content) can be well identified by whoever whenever (although the content is upgraded from time to time). Verification of the result, i.e. the process required in the scientific research, can thus be done in a rigorous way, using exactly the same data.

In 2025, the upgrade of the data on the individual meteors will continue with the addition of EDMOND, SonotaCo 2024, and GMN data. The list of showers will be improved, especially with a more complete information about the parent bodies.

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