

# The Extensive Database of Astrophysical Maser Sources (eDAMS): the First Release on Circumstellar Maser Sources

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**Abstract.** We introduce the newly developed database of circumstellar maser sources. Until now, the compilations comprehensively including the three major maser species in evolved stars (i.e., SiO, H<sub>2</sub>O, OH) has been practically limited only to the Benson's catalog (Benson et al. 1990), which was published more than a quarter of a century ago. For OH masers alone, there exists the University of Hamburg (UH) database, but there is no updated compilation work for H<sub>2</sub>O and SiO masers. In order to utilize the information of masers in actual studies, it is highly desirable to have a database containing all the three masers. We are currently constructing a database covering SiO, H<sub>2</sub>O and OH masers. This database consists of a web-service, which accesses compiled maser observations in available archives and combines them with the data we newly collected and IR databases. The archives currently used are the OH maser archive from Engels & Bunzel (2015), and H<sub>2</sub>O and SiO archives, which are currently under construction. So far, the information of about 27,000 observations (about 10,000 objects) has been implemented. We also have a plan to extend the database by including higher transitions and other types of objects, such as young stellar objects, in future. In this paper, we briefly summarize, (1) outline of the data collected, and (2) future development plans of the eDAMS system. The URL of the database is as follows: <http://maserdb.ins.urfu.ru/>

**Keywords.** masers, astronomical data bases: miscellaneous, catalogs, stars: AGB and post-AGB, stars: late-type

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## 1. Summary of the Collected Data

The initial release of eDAMS† is dedicated to the circumstellar maser sources of evolved stars mainly in the following maser lines: SiO  $J = 1-0$ ,  $v = 1$  & 2 (43 GHz), H<sub>2</sub>O 22 GHz, OH 1612, 1665, 1667 MHz. The data are taken mainly from 5 published/unpublished

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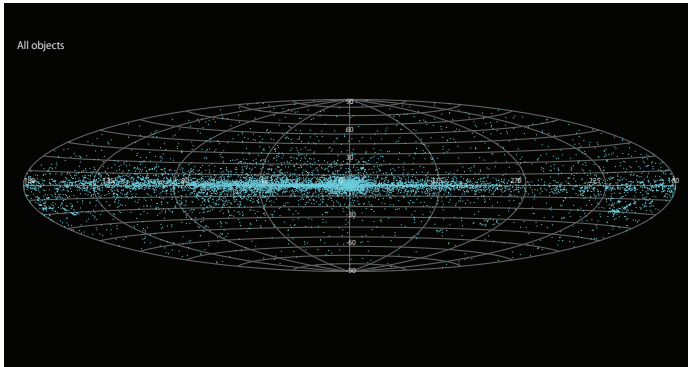
compilation catalogs (see, the eDAMS web for the details of the used catalogs). The OH data are based on the OH maser archive from Engels & Bunzel (2015). The H<sub>2</sub>O data are based on an on-going compilation work (PI: Engels, D.). A significant amount of additional data of other maser transitions (for example, SiO  $J = 1 - 0$   $v = 0$  & 3, SiO  $J = 2 - 1$ ,  $v = 1$  & 2, <sup>29</sup>SiO  $J = 1 - 0$   $v = 0$ , etc.) are also included in the database, but the data survey for these lines are still not completed (the data will keep updating). We note that a non-negligible number of unpublished data of the Nobeyama SiO maser survey project are released to the public for the first time (the number of unpublished Nobeyama observations is about 400). In addition to the basic line parameters (such as intensity, velocity, line-profile, etc.), for a part of the observations, spectral data in ascii format are available, so that users could process the spectral data for their own purposes. In total, at this moment, 10466 objects, which have been observed, at least, in one of the OH, H<sub>2</sub>O or SiO maser lines or in the multiple maser lines, are included in the database (the distribution of the objects in the Galactic coordinates is given in Figure 1). Among the 10466 sources, the number of objects observed in the SiO, H<sub>2</sub>O and OH maser lines are 3745, 3863, and 6372 respectively (overlaps exist between different maser species).

## 2. Future Development Plans

The eDAMS project has following future development plans: (1) Add the data of the higher- $J$  transition lines of circumstellar maser sources, so that the system would be useful for potential users of latest sub-mm telescopes, such as ALMA and SOFIA. (2) Increase the number of ascii spectral data, so that the users could process the data for their purposes. (3) Add the data of other kinds of astrophysical objects. For the moment, we have a plan to add the data of methanol masers of young stellar objects (YSO), of which the data collection has been basically already finished. (4) Add the reduced FITS images of the KaVA ESTEMA project, which is a VLBI imaging survey of circumstellar masers of mira-type variables. (5) Additionally, we will keep adding new data whenever the new data are published/released. We would very much appreciate if you could inform us when you publish new papers, which include maser observations.

## References

- Benson, P. J., et al. 1990, *ApJS*, 74, 911  
 Engels, D., & Bunzel, F. 2015, *A&A*, 582, A68



**Figure 1.** Distribution in Galactic coordinates of  $> 10000$  objects included in the eDAMS database. These objects are observed, at least, in one of the OH, H<sub>2</sub>O and SiO maser lines, and the both detections and non-detections are included.