The second table is needed to specify the different trains for the greatest shower observed during the whole observation. In the first line the magnitude distribution has to be filled in. The rest of the table is used for the train distribution of the shower. The last line gives the percentage of trains per magnitude class. Meteors brighter than −6 or train durations exceeding 5 seconds duration do not fit in the table and must be specified underneath.

The last lines have to be used for other showers and sporadics, each first line for the magnitude distribution and each second line for the trains. Write down the data of all observed showers; also if you did not see a meteor or train of that shower then just write 'no meteors' or 'no trains', this is valuable information too!

When the form is filled in, it can be sent to us. Alternatively it is certainly possible to send an e-mail with the observational data to the given address. You can put your data in your e-mail text or as an attachment in plain ASCII or text format if possible.

4. Conclusion

We hope that a lot of observations will come to us in order to set up a database that will be used for the above mentioned investigations. The possible daily variation will only be recognized if many observations are gathered together. That is why we encourage meteor observers to take this little effort extra to send in the necessary information. Observations from previous years can also be sent to us and would be very helpful.

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Dark Meteor Database: News from 1998–2001

Alastair McBeath

An update of information collected by the Dark Meteor Database since the previous article in 1998 [1] is presented and discussed. The proportion of observers who have reported dark meteors remains at about 70%. A possible new form of dark meteor which may be due to test flights of military vehicles is noted, along with some comments on a recent observation of far-ultraviolet meteors from space.

1. Introduction

Judging by the rate of dark meteor reporting, or its absence, where no fresh reports were submitted during 2000, though new information arrived in both 1998 and 1999, it seems clear that observers need more regular reminders that this project continues to exist, and that we need people to continue providing positive and negative reports of dark meteor sightings on a more regular basis. In order to assist potential observers, the standard dark meteor report form is again published with this article, and all who have not yet reported details are invited to do so.

For newcomers to the *IMO*, or those who have forgotten, dark meteors are meteor-like streaks of darkness seen against the night sky because they are apparently blacker than the very deep blue of the clear, starlit sky. Descriptions from observers of these events were given or referred to in earlier articles in this series (for references, see [1]), and as these are still available as back issues of the appropriate publications, there seems little need to repeat them again here.

Reasons were also outlined earlier for ensuring the anonymity of all observers reporting dark meteors, an anonymity which was extended to those people providing other thoughts and material on dark meteors in [1], and this policy is continued here.

2. New reports

Between April 1998 and March 2001, five more people provided dark meteor information for the first time, four with observations of such occurrences, and one who despite years of visual meteor watching had not seen any dark meteors. This brings the total number of observers to 44, with 12 confirming they had never knowingly seen a dark meteor, and 32 reporting at least one event. The proportion of positive sightings thus increased slightly to 73% this time, an imperceptible shift from the 72% of the previous report.

Two established observers also provided fresh data on the numbers of dark meteors seen over a given time interval (specifically during their meteor watching in 1998), and how many "ordinary" meteors were observed in the same time. The totals of these values now reported stand at 21 dark meteors in $454^{\mathrm{h}}4$, with 4751 normal meteors seen. From these, average "dark meteor rates" of roughly one per 22 h observing, or one dark meteor for every ≈ 226 ordinary events, can be derived, but these should be viewed more as confirming the relative rarity of dark meteors, rather than giving specific values for direct comparison. As was noted before, there is a tendency for dark meteors to avoid less clear nights, but the evidence for this is still tenuous.

The appearances described by most observers were generally unchanged from earlier discussions, though there seems a growing, if still too often circumstantial, body of reports favoring dark meteors as having moderate to fast apparent angular motions in the sky, compared to typical meteoric apparent speeds. There is a similar set of reports which suggest most dark meteor tracks are relatively short—no more than 10°–15° in the estimates so far. As with all the above details however, much more hard information is needed.

One observer reported seeing an unusual number of possible dark meteors over an extended period of time, which seemed rather different to the more commonly reported objects of this class. The descriptions of these included some seen using 10×50 binoculars as well as the naked-eye, and were often of a "V"-shaped effect, rather like the shock wave around the head of a bullet, though some were also described as looking a little like a dark half-Moon. These do not appear to have been reported by others before, even those past observers using optical instruments, and certainly not in comparable numbers (several a night at times). Attempts to clarify whether the effects were specific to that observer met with little success, as either clouds intervened when a suitable co-observer was available, or no one was on-hand to compare data with on clearer nights and one or more of these dark objects was observed. There was some concern that a military base was relatively nearby, and that some, perhaps all, of these curious objects resulted from nocturnal exercises using unknown types of flying vehicles. The nature of such military activity could not be established, unsurprisingly, and attempts by the observer to watch from different sites to see if anything similar was reported well away from the usual location, were also unsuccessful, with too little observing time amassed elsewhere to give a viable comparison. We can only hope that future efforts will be more fortunate in better-defining what was being seen in this case.

3. Ultraviolet meteors

A forwarded press release posted on *IMO-News* on February 17, 2000 ("NRL Instrument Makes First UV Observation of Meteor in Space"), discussed the first far-ultraviolet meteor image being recorded by an ionospheric monitoring instrument on board the US Department of Defense's ARGOS satellite, on November 18, 1999. Far-ultraviolet light is heavily absorbed by the Earth's lower atmosphere, so such observations from the ground are generally considered impossible, and although an actual height determination was not possible for this meteor, known atmospheric absorption parameters mean the meteor must have been significantly higher than 100 km above the surface.

One of a number of possible explanations I suggested in the first article in this series [2] for dark meteors was the rare detection of meteoric ultraviolet light, and this new observation brings us back to reconsider this aspect again. Obviously, a great deal more data is needed on ultraviolet meteoric emissions, but it is interesting that the presently available data suggests such emissions can occur well above where most visible meteor ablation happens in the atmosphere. This would tie in very well with I.S. Astapovich's visual observations of "blue pre-meteor trains" in very transparent skies (see [3] on these), if not the more typical dark meteors. The next step would be to establish whether and how well a range of human eyes can detect ultraviolet light, and compare that with the rarity of dark meteor sightings and overall levels of meteor activity.

Acknowledgments

My thanks are extended to all past contributors to the Dark Meteor Database. Anyone with new data to report is encouraged to do so.

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