Meteor Velocity Distribution from CILBO Double Station Video Camera Data

E. Drolshagen, T. Ott, D. Koschny, G. Drolshagen, B. Poppe
Table of Contents

- Velocity Distribution
- Stream Velocity
- Apex Contribution
- Conclusion and Outlook
Table of Contents

- Velocity Distribution
- Stream Velocity
- Apex Contribution
- Conclusion and Outlook
June 2013 – May 2014

La Palma (ICC9)

Tenerife (ICC7)
Meteor Orbit and Trajectory Software
Velocity Distribution
All Meteors

![Histogram of meteor velocities in km/s bins](image)
Velocity Distribution
Sporadics

Number of meteors

Meteor velocities, 1 km/s bins
Velocity Theory

![Velocity Distribution](image)

- **CILBO**
- **100 km**

The graph shows the normalized velocity distribution as a function of velocity (v) in km/s. The blue line represents the CILBO distribution, while the green dotted line represents the 100 km distribution.
Velocity Distribution
Sporadics, Masses $> 0.5g$
Table of Contents

- Velocity Distribution
- Stream Velocity
- Apex Contribution
- Conclusion and Outlook
Velocity Distribution
Southern Taurids

One camera categorization

IMO velocity: 27 km/s
Mean Velocity: 28 km/s

Two camera categorization

Mean Velocity: 30 km/s
IMO velocity: 27 km/s
Velocity Distribution
Perseids

Mean velocity: 56 km/s
IMO velocity: 59 km/s

One camera categorization

Mean velocity: 56 km/s

Two camera categorization
Table of Contents

- Velocity Distribution
- Stream Velocity
- Apex Contribution
- Conclusion and Outlook
Sporadic Velocity Distribution

![Histogram of Meteor Velocities](image_url)

- Number of meteors vs. Meteor velocities, 1 km/s bins
Sporadics throughout the night
East → West

West → East
70% less than
East → West
Sporadic Velocity Distribution as a function of local time

5h – 6h
Apex Contribution
Table of Contents

- Velocity Distribution
- Stream Velocity
- Apex Contribution
- Conclusion and Outlook
Conclusion

- Shower velocities match the IMO values
- Velocity Distribution of heavier Meteors matches the Theory
- Sporadic Velocity Peak at 60 km/s comes from the Apex Contribution

Future Work

- Analyze more showers
- Determine the true velocity distribution of the unbiased measurements
- Conduct an error evaluation
Thank you all for your attention!