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Photo: MoMet team.

Chaos in Nothern and Southern Taurids

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Work based on previous works done on Geminids, Draconids, Leonids

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Orbit different from meteoroid streams we studied before

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Branches studied : Nothern (NTA) and Southern (STA) Taurids

First idea : from orbital elements found in meteor networks (CAMS, Edmond, SonotaCo)

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Too wide for computation => use of theoretical data as found in IAU MDC 3





Integration for 1000 years (large particles) \rightarrow negligible NGFs



STA very similar to NTA => focus on NTA









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3 areas of stability => why ?











Bodies periods are proportionnal. In some configurations : no close encounters





First 2 areas : 9:2 and 7:2 with Jupiter?



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Dark areas from mean-motion resonances ?



First 2 areas : 9:2 and 7:2 with Jupiter? No MMR corresponds to 3rd stable area !

Integration done again, but without Jupiter



Integration done again, but without Jupiter



Integration done again, but without Jupiter



The 3 areas disappear : Jupiter is responsible for stability !

Integration done again, but without Jupiter



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Conclusion

- Difficulty of using orbital elements from data
- Taurids : very chaotic compared to other meteoroid stream (Geminids, Draconids, Leonids)
- Next : verify MMRs found. Find how Jupiter stabilizes the third region ! Ideas ?
- In the future : add non-gravitational forces



For more information about the method and previous results : Courtot et al, 2023, 2024

Thank you for listening !

Questions ? Remarks ?

