

2011 Draconids: storm or just an outburst?

J. Vaubaillon - IMCCE

M. Sato - NAOJ

J. Watanabe - NAOJ

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Outline

- Introduction to Draconids
- Past storms: “who” was responsible?
- The 2011 encounter: how many meteors?
- Consequences: where to go? what to do?
- Conclusion

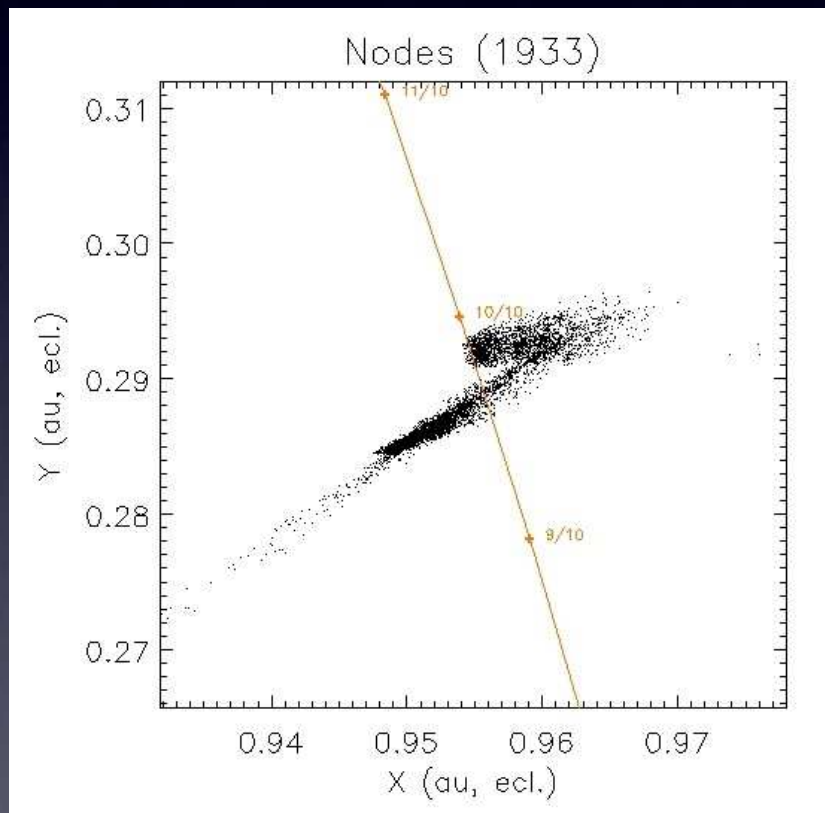
Introduction to the Draconids

- parent body: comet
21P/Giacobini-Zinner
 - discovered in 1900, most depleted comet (A'Hearn et al. 1995)
 - Trail not always detected by IR obs (Telesco et al. 1986, Pittichova et al. 2008)
 - presence of organic matter in dust (Kiselev (2000))
- storms in 1933, 1946 (+10000/hr), outburst in 1952 (250/hr), 1985 (550/hr), 1998 (500 /hr)



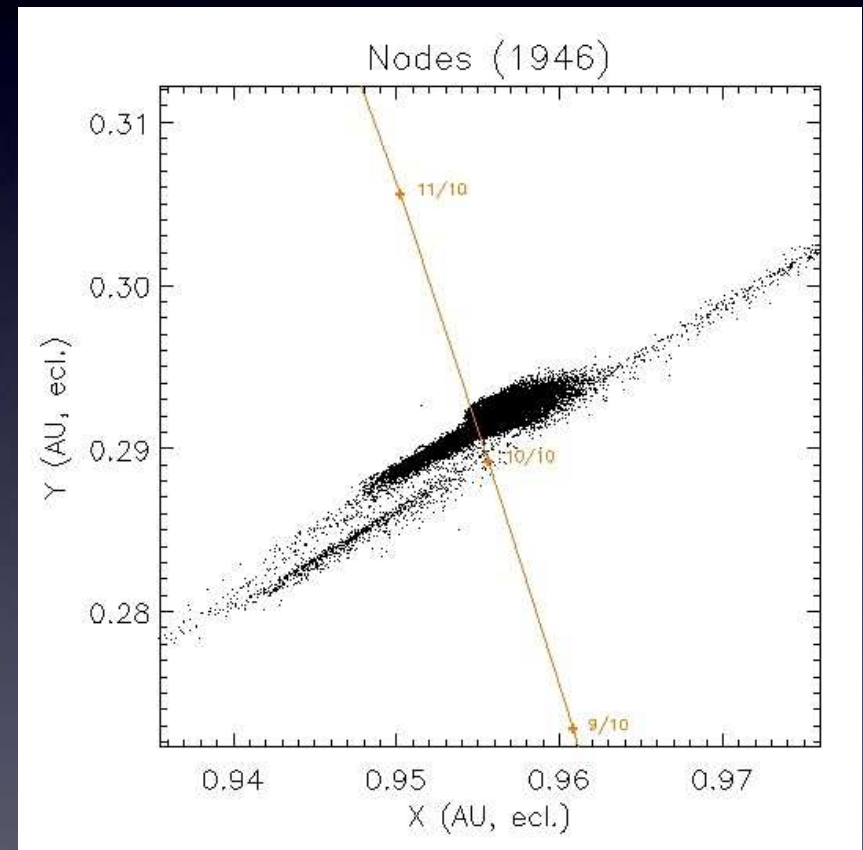
1946 Draconids by H. Kondo, observed from Japan
(scan from P. Jenniskens "Meteor shower & their parent comets")

Past storms: who was responsible?



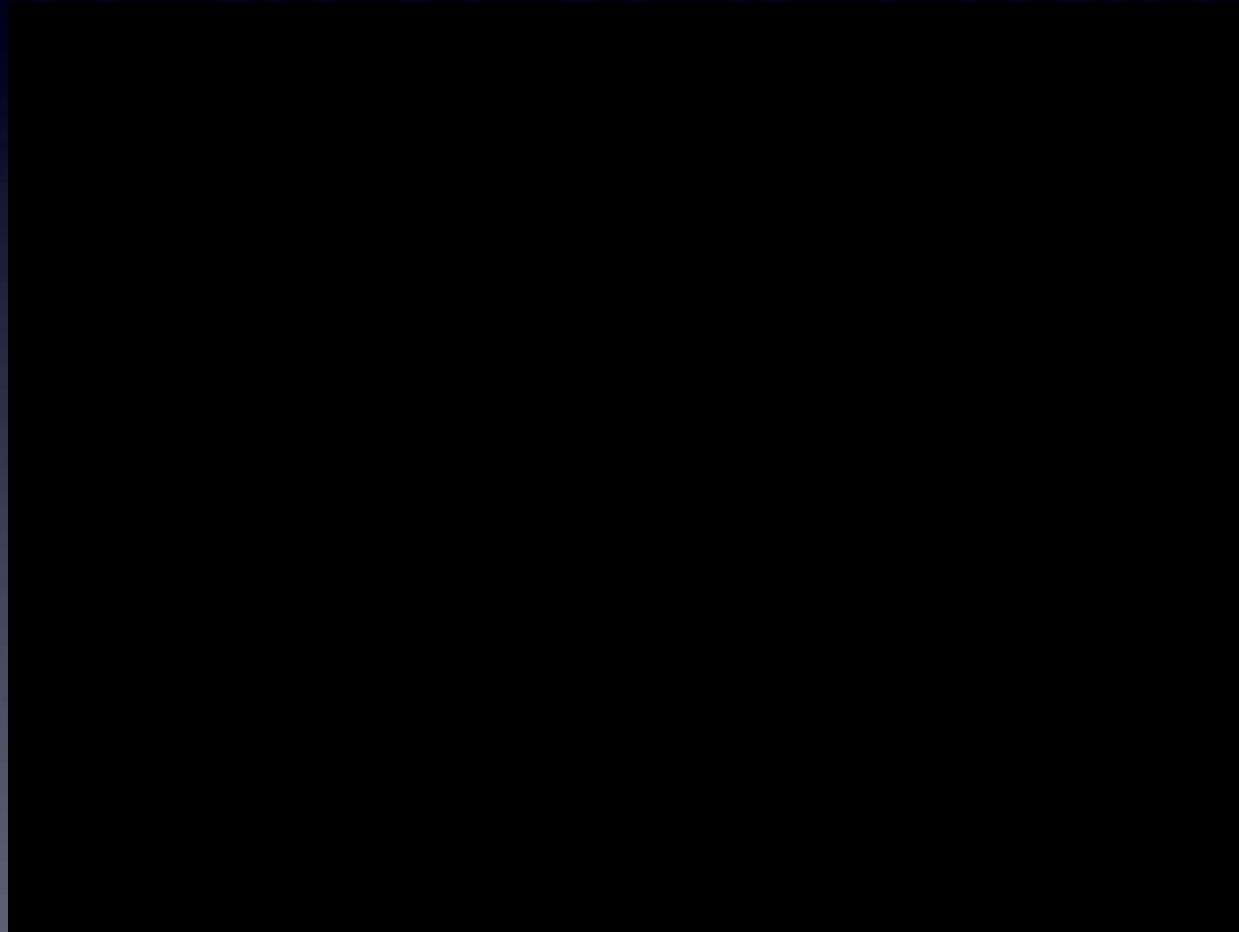
ZHR~10000/hr

both
cases :
1900 &
1907
trails

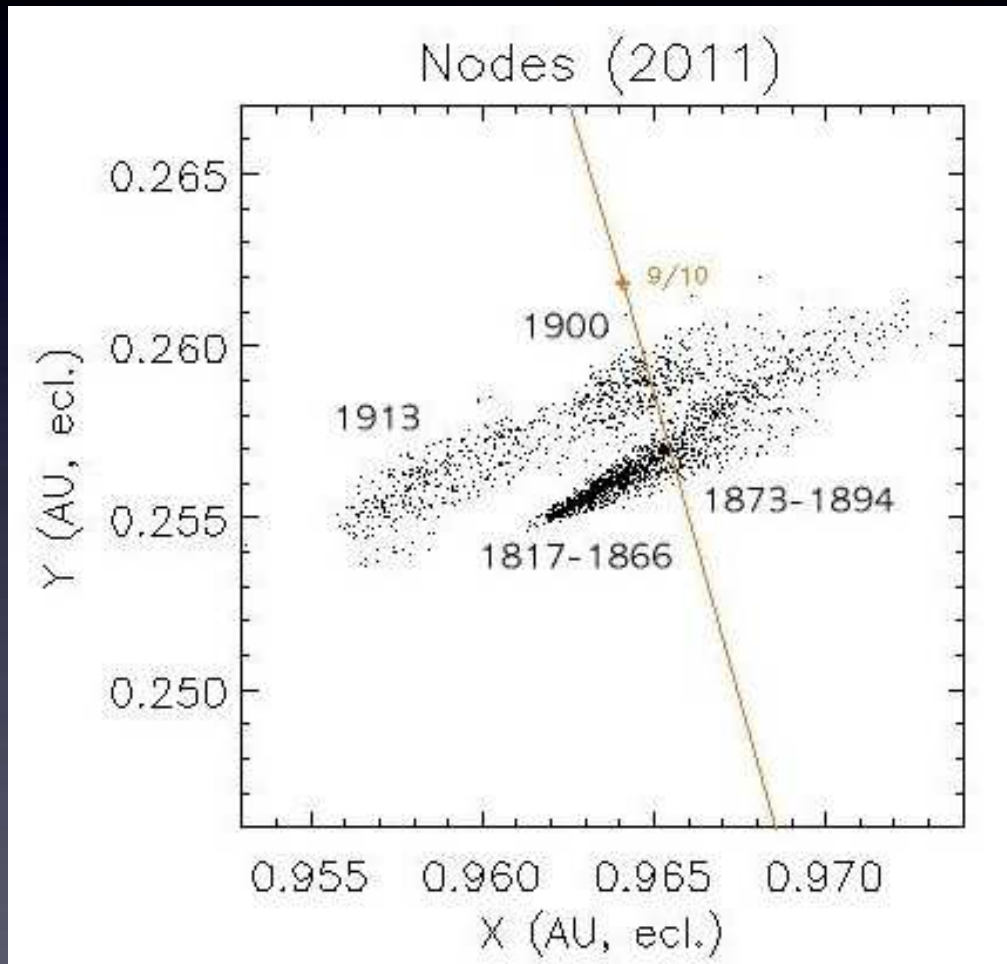


ZHR~12000/hr

Dynamics of the 1900 trail

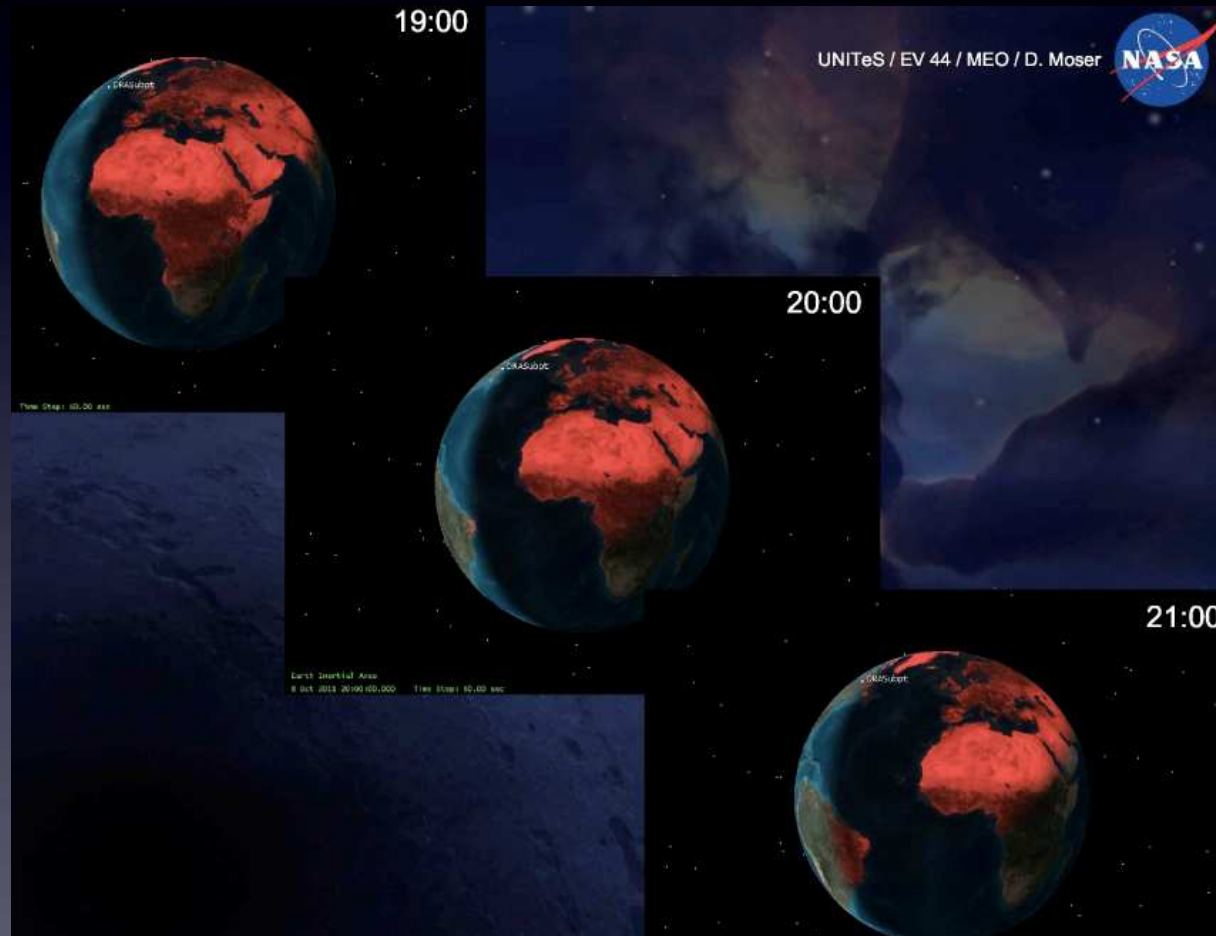


The 2011 encounter



model	time on Oct 8th (UT)	ZHR (/hr)
Sato, Watanabe (2008)	17:05	100
Sato, Watanabe (2008)	20:36	500
MSFC (Moser 2007)	19:11	800
Maslov	20:42	40-50
1900 trail (Vaubaillon)	19:57	~600
1873-1894 trails	17:09	~60 (?)

Where to observe?



Courtesy D. Moser - MSFC/NASA

Problems - Solutions

- 1985 outburst not explained with this solution => need much older trails (uncertain by nature)
- change in comet activity to explain the 1933 and 1946 storms (Watanabe & Sato 2007) => clues of what happened to the comet by observing the 2011 outburst

Questions to answer

- What really was the **level** in 1933 & 1946? =>calibration with the 2011 outburst (same trail!)
- **Where** was the comet before 1900?
- Did the comet change its **activity** between 1900 and today? How?
- Definitely prove the presence and **quantify** the number of large grains

Conclusion

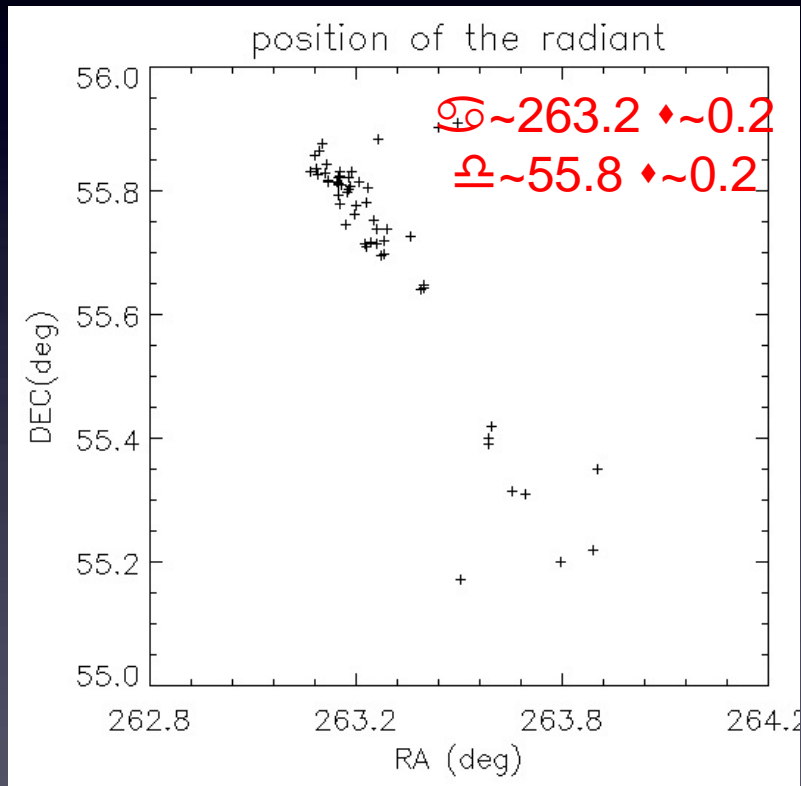
- 2011 Draconids: no storm, but almost (!)
- => get orbits from double-stations (see M.K. Kwon Java Applet at www.imcce.fr)
- European Airborne campaign in preparation: come talk to me!!! (proposal deadline: Sept 30th...)
- Clear skies!!!

Acknowledgements

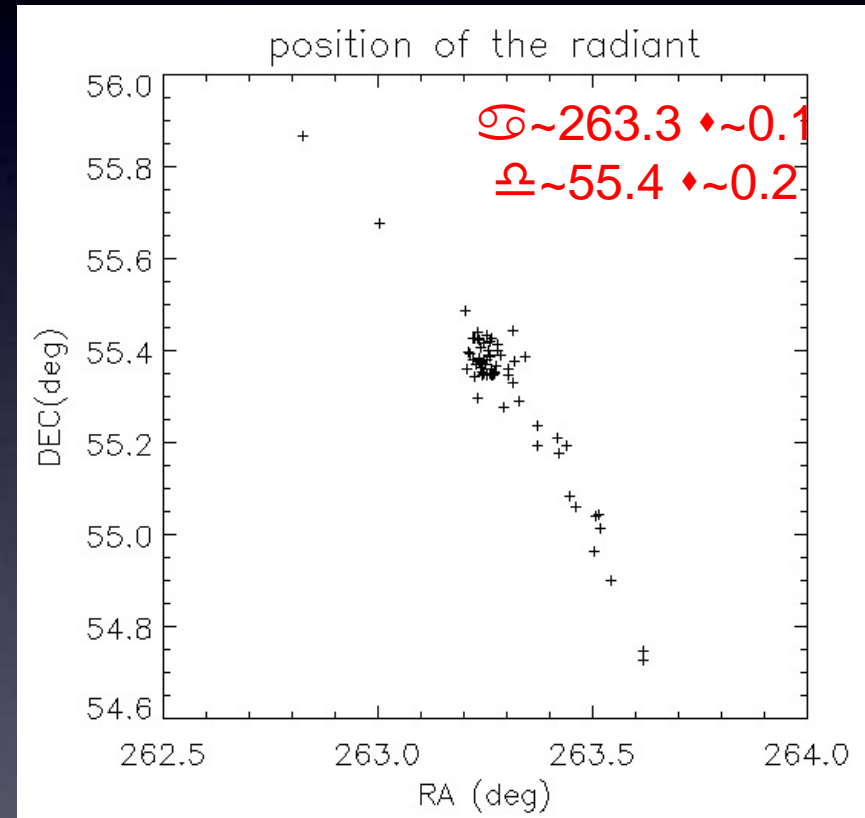
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Expected radiant



1900 trail



1887 trail