SUMER observations of comet ISON during perihelion

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Outline

• prologue
• approach phase
• perihelion passage
  - observations
  - results
• post encounter and outlook
Secular Lightcurve of Comet ISON (C/2012 S1)

Solar elongation <45°
- Red dots: Magnitude measurements from MPC
- Triangle: ICQ Total magnitudes
- Black line: JPL Horizons estimate of total magnitude

\[ T - \text{Mag} = 8 + 5 \times \log(\Delta) + 8 \times \log(r) \]

CIOC lightcurve, update on Nov 27

Solar Group Seminar
Curdt, February 18
enhanced image of Nov 16 showing wings courtesy HBO
foto taken Nov 22
courtesy F.-H. Hemmerich
encounter geometry

- --- accessible FOV
- — imaged area
- ---- predicted trajectory
LASCO C2 images taken on Nov 28
slot image in Ly-α scattered light
cometary dust tail at a cadence of 30 s
+ predicted nucleus position
- trajectory
dust tail details

+ predicted nucleus position

- tail bisector

- trajectory (30 s steps)

↑ vector to Sun center
Comet ISON: Dust Synchrones & Syndynes
Comet ISON: Dust Brightness
Comet ISON: Dust Brightness

Sharp drop of dust production ~ 0.5 days before perihelion
- spike coma with brightness decrease in motion direction
- PA ~ 65 deg (model) compared to PA ~71 deg (SUMER)
- nucleus is not in dust cloud
- dust cloud is offset from nucleus trajectory
- dust cloud has asymmetric brightness profile
Ly-α profile, disk average  

composite Ly-α irradiance at 1 AU (LISIRD): $6.24 \text{ mW/m}^2$

tail radiance (brighter sections): $24 \text{ mW/(m}^2 \text{ sr)}$
selected spectral windows in spectral mode:

1167 … 1175 / 1199 … 1207 He II, C III, Si II, Si III, H-H
1049 … 1055 / 1078 … 1088 O I, N II, CO
1036 … 1045 / 1069 … 1077 C II, O VI, Si IV,
1301 … 1310 / 1333 … 1341 O I, O I, O I, Si II, CII
Comet ISON: Dust Synchonones at Perihelion