

Exoplanets

around HD 38529

Proposal for the PRIMA Instrument

- Anatoliy IVANTSOV
- Iva KAROVICOVA
- Dmitriy KONONOV
- Martin NETOLICKY
- Boris SAFONOV



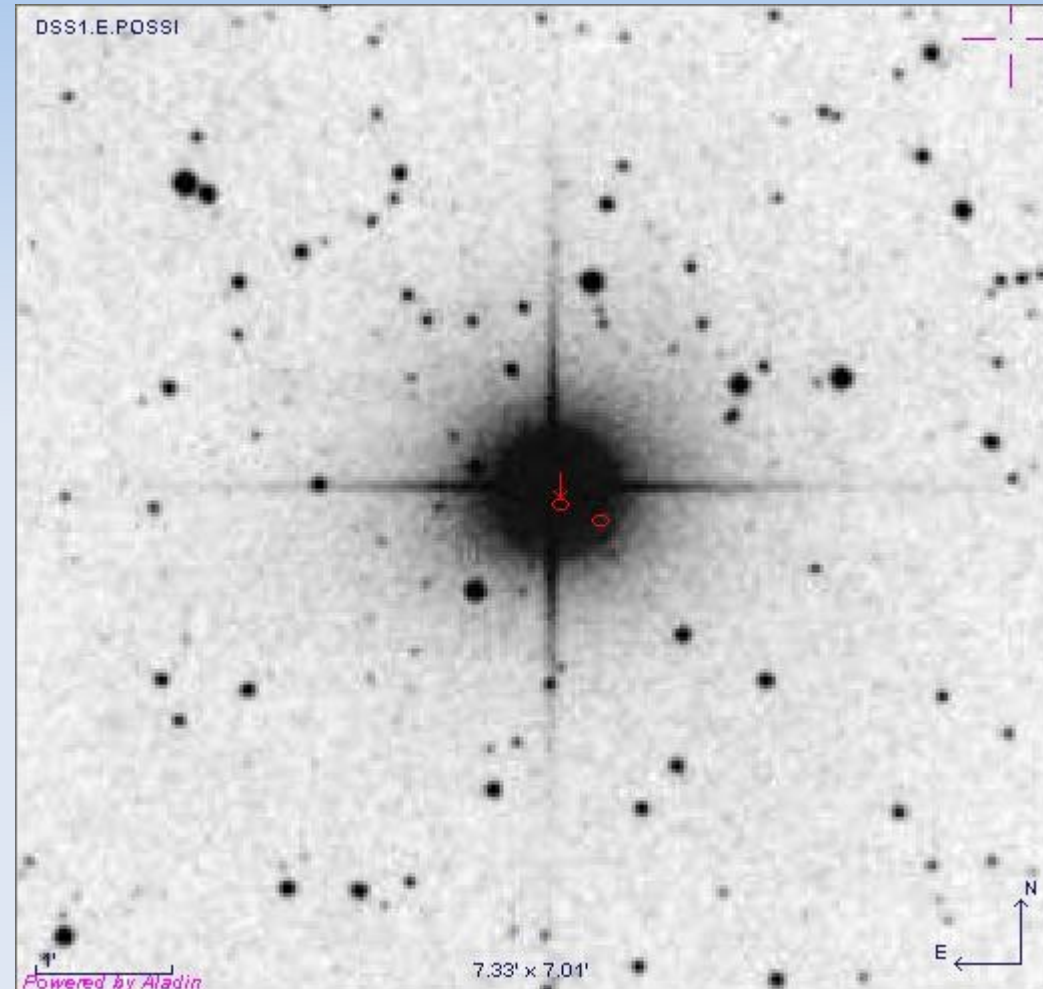
Scientific goals

- Resolve the $\sin(i)$ uncertainty from planet masses already found by radial-velocity surveys
- Confirmation of hints for long-period planets in radial-velocity surveys. Many stars with detected short-period planets also show long-term trends in the velocity residuals
- Discovery of planets around stars of different masses and ages
- Detection of multiple systems, especially those which have small planets at large distances
- Measure whether multiple systems are coplanar or not. Many of the known extra-solar planets have highly eccentric orbits, which can be a sign for the strong gravitational interaction between the planets

Requirements for PRIMA

HD38529 Reference star

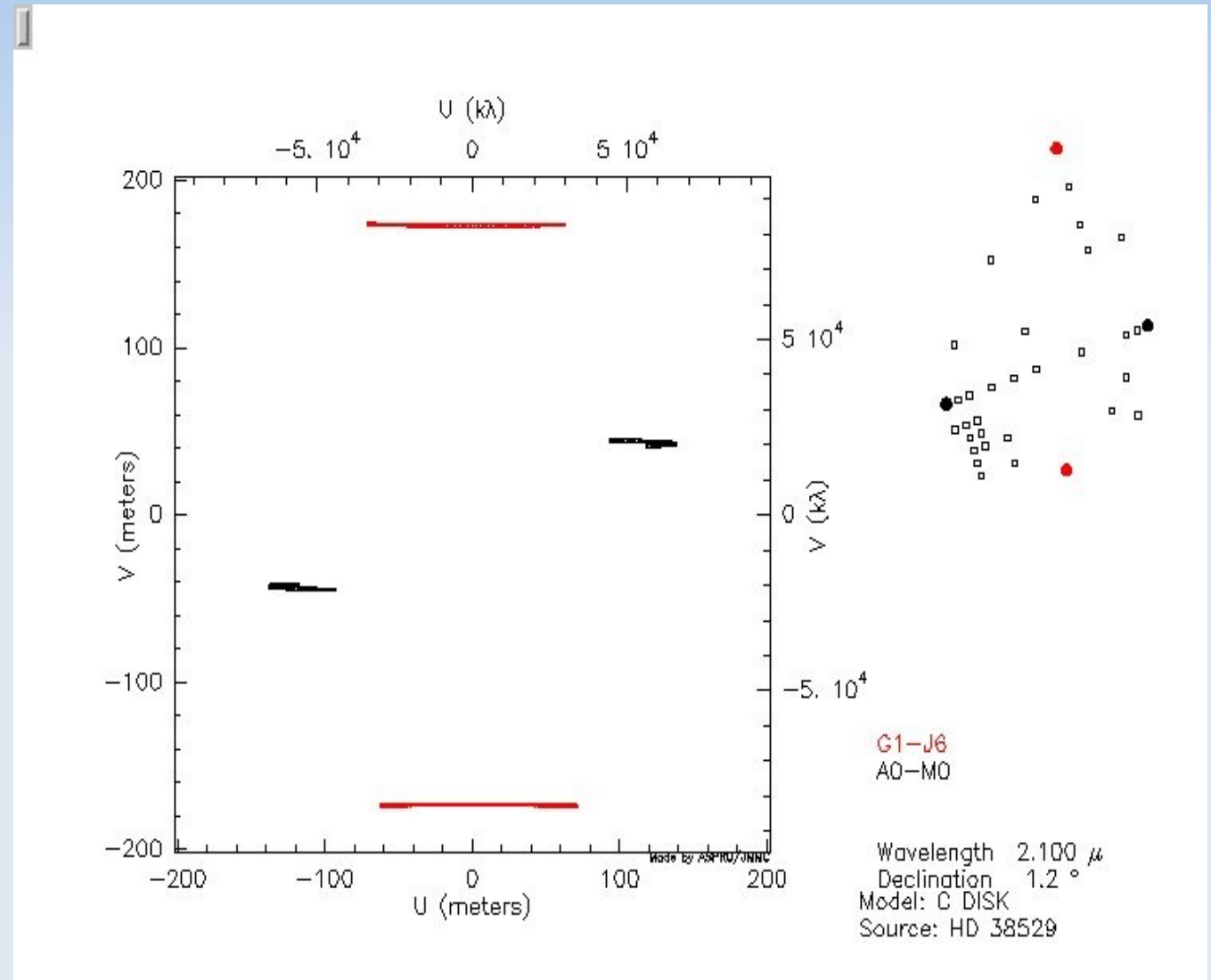
- $\alpha=5^{\text{h}}46^{\text{m}}34.912^{\text{s}}$ $\alpha=5^{\text{h}}46^{\text{m}}33.78^{\text{s}}$
- $\delta=1^{\circ}10'05.496''$ $\delta=1^{\circ}09'58.7''$
- $K=14.0$
- $V=5.93$
- $K=4.21$
- 2 planets



Launhardt, R. et al.: Astrometric Survey for Extra-solar Planets with PRIMA (2003)

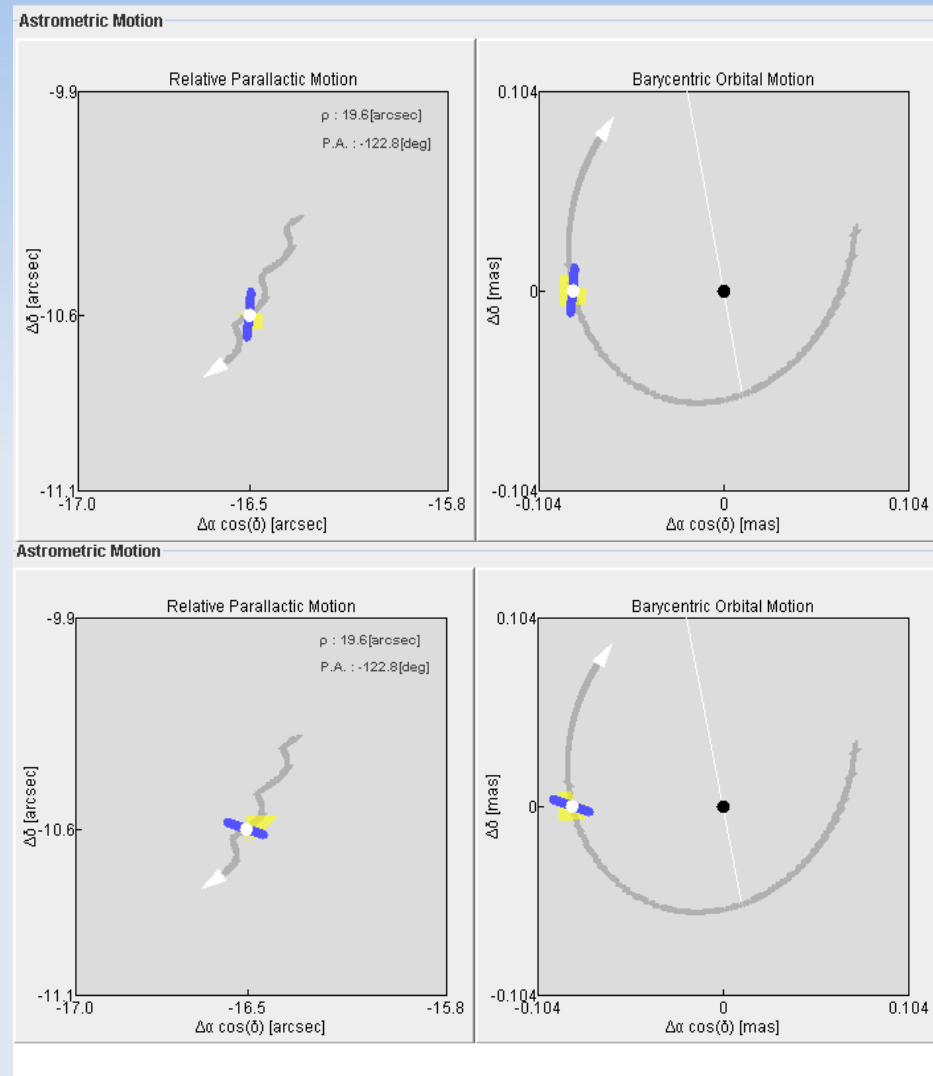
Observation

- 18-DEC-08
- 30-DEC-08
- ATs
- A0 – M0
- G1 – J6



Astrometry Simulation

- G1-J6 baseline
- Std. error $22 \mu\text{as}$ in 30 min of integration
- Std. error $10 \mu\text{as}$ in 140 min of integration
- A0 – M0 baseline
- Std. error $25 \mu\text{as}$ in 30 min of integration
- Std. error $10 \mu\text{as}$ in 180 min of integration



Conclusions

- The PRIMA/VLTI is capable to measure the reflex motion of the stars due to the exoplanets.
- We showed the possible setup for the star HD38529 and estimated the accuracy which can be achieved.

Acknowledgements:

Our sincere gratitude to the teachers of the VLTI School
"Astrometry and Imaging with the Very Large Telescope Interferometer"
and especially to Laszlo Mosoni.