

NICOLAUS COPERNICUS UNIVERSITY IN TORUŃ

Faculty of Physics, Astronomy and Informatics

# Cloudlet evolution in IRAS 20126+4104 during last 15 years and its periodic variability

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R. Cesaroni et al. 2013

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#### IRAS 20126+4104 (G78.122+3.633)

- B0.5 spectral class star with ~7- 12  $M_{\odot}$  surrounded by Keplerian disk (Cesaroni et al. 1997)
- Water maser jet and proper motion studies (Moscadelli et al. 2011a)
- Trigonometric parallaxes with mean value of 0.645±0.030 mas implying distance of 1.6 (+0.3 -0.12) kpc (Reid et al. 2019)

• Rotation energy is less than magnetic (Surcis et al. 2014)



#### IRAS 20126+4104 EVN observations, with full array including:

Jodrell Bank, Effelsberg, Medicina, Onsala, Torun, Westerbork, Yebes, Sardinia, Hartebeesthoek, Irbene and Tianma.



#### Five epochs of IRAS 20126+4104 with EVN over 15 years



#### Cloudlet 1



Cloudlet 2 (group 1)



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Cloudlet 7 (group 1)
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Cloudlet 5 (group 2)
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200 150 100 50 0 -50 -100 -150 -200Δ RA (mas)

Cloudlet 6 (group 2)



### Monitoring using Irbene RT-32 and RT-16



# Torun monitoring from 2009 -2013 (Szymczak et al. 2018)



### Tentative indications of periodic variability

Note! Lower period significance, when look to full time series



100

Active variability period



#### Relative flux to -6.1 km/s component



### Conclusions

- High variability doesn't relate to significant maser morphology changes
- Individual cloudlets can exist for 15 + years
- Individual cloudlet morphology can change significantly
- Cloudlets tracing infalling material on disk (group 2) are more variable in sort and long-time scales
- Cloudlets in disk jet interface (group 1) are less variable, but their morphology are more complex
- Possible periodic variability is tentatively detected, and for now we are favoring idea of increasing accretion activity.

## Thank you for attention!

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