Yet another 6.7 GHz imaging of the high-mass star-forming region Cep A HW2

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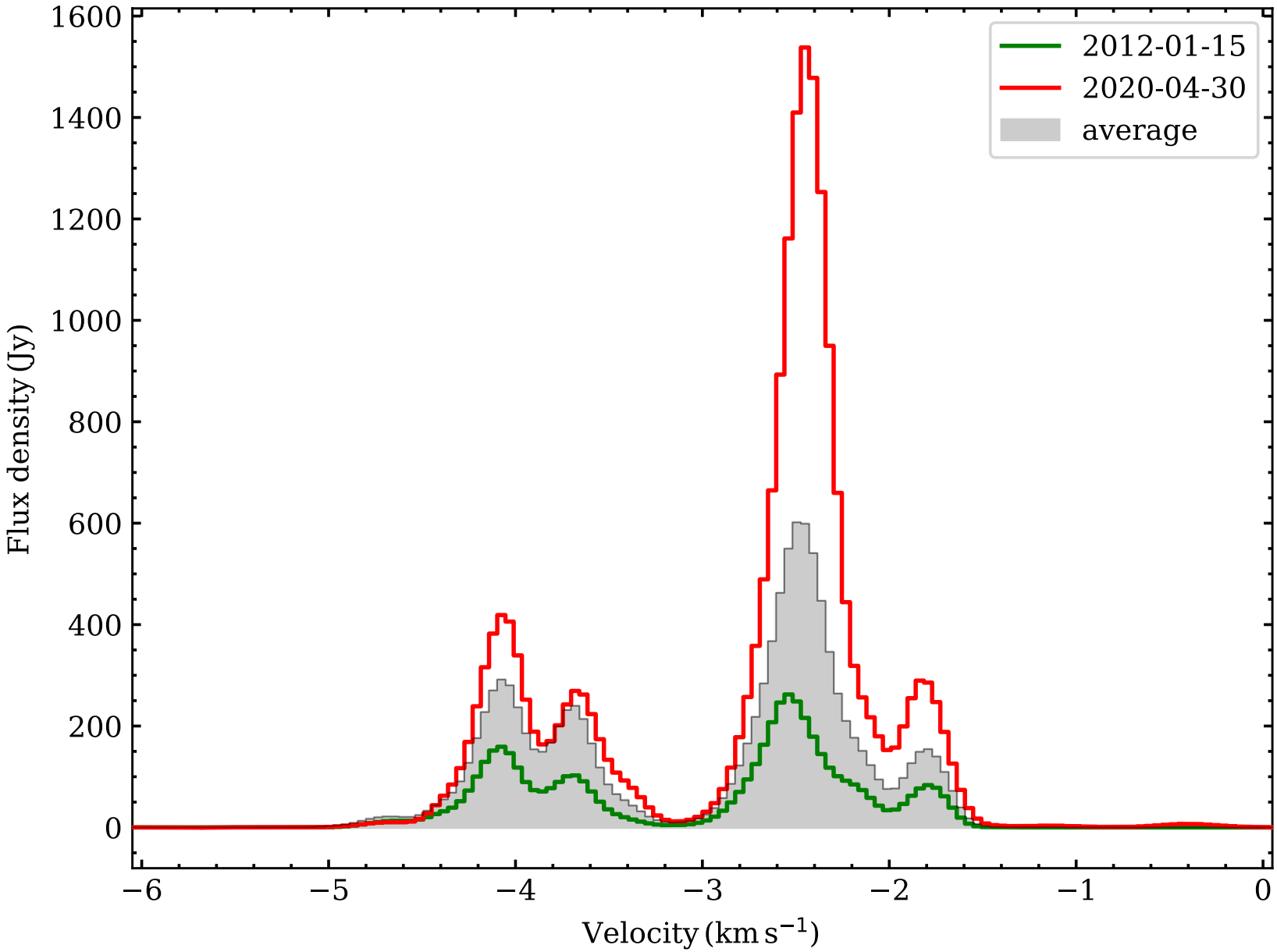
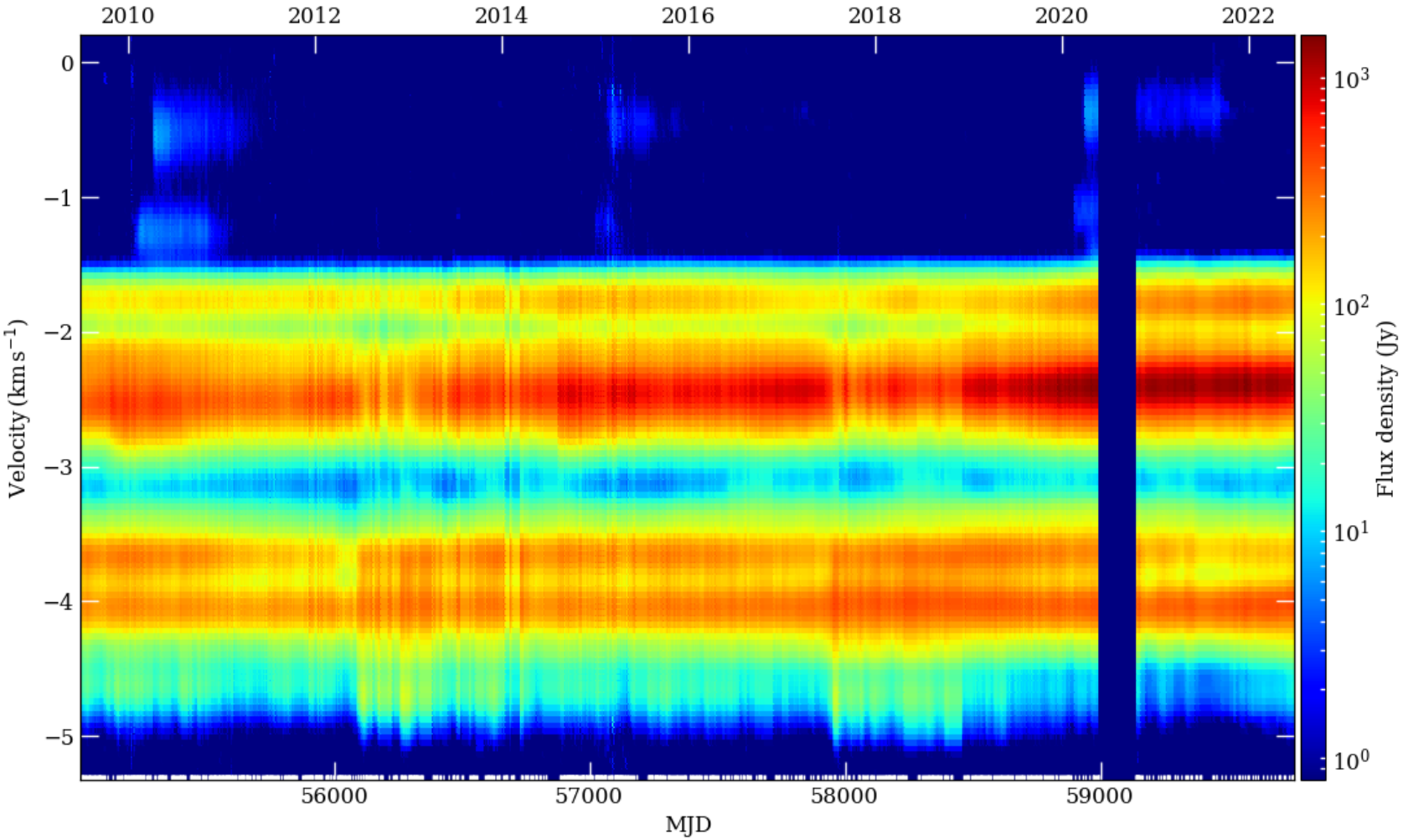
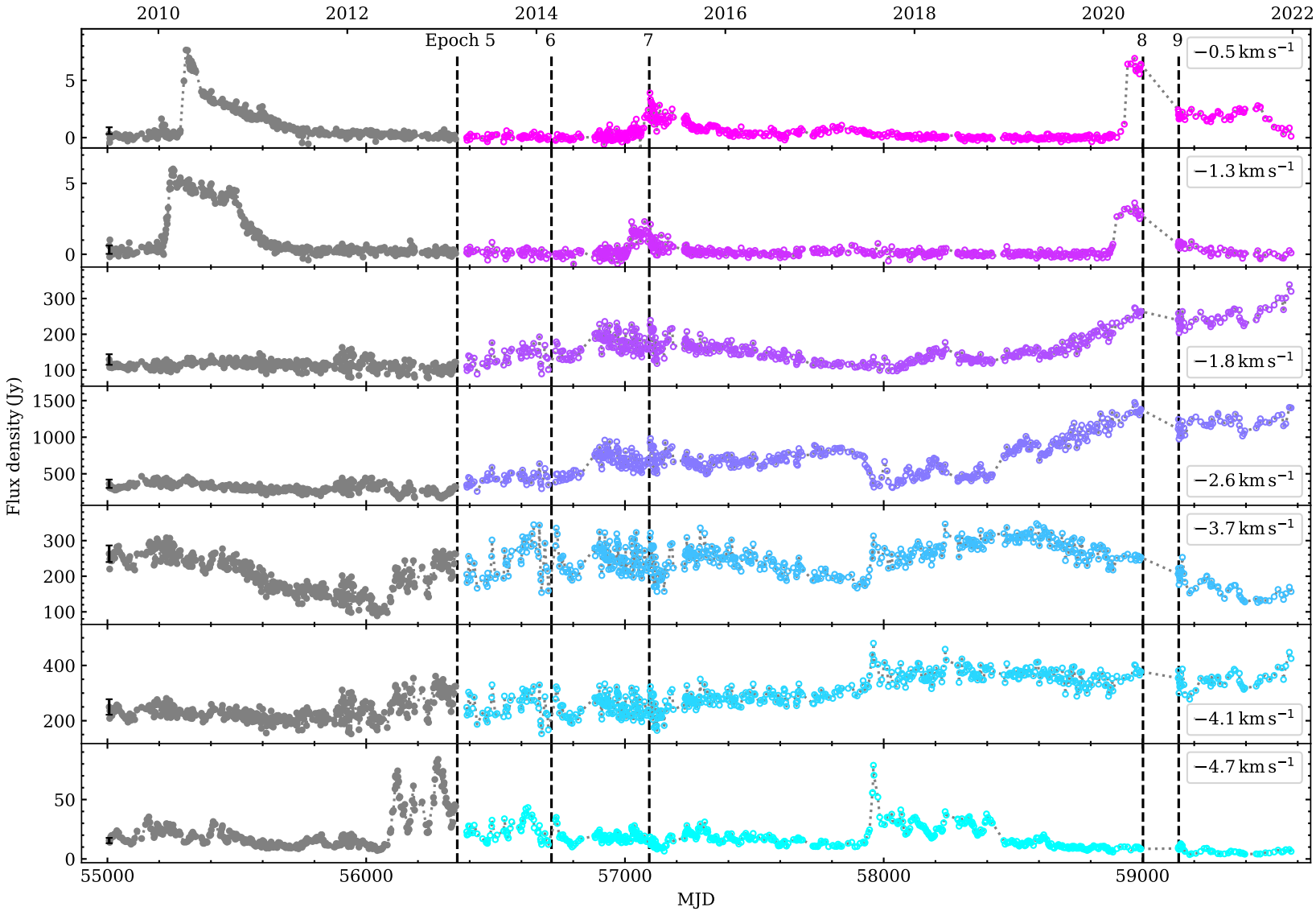
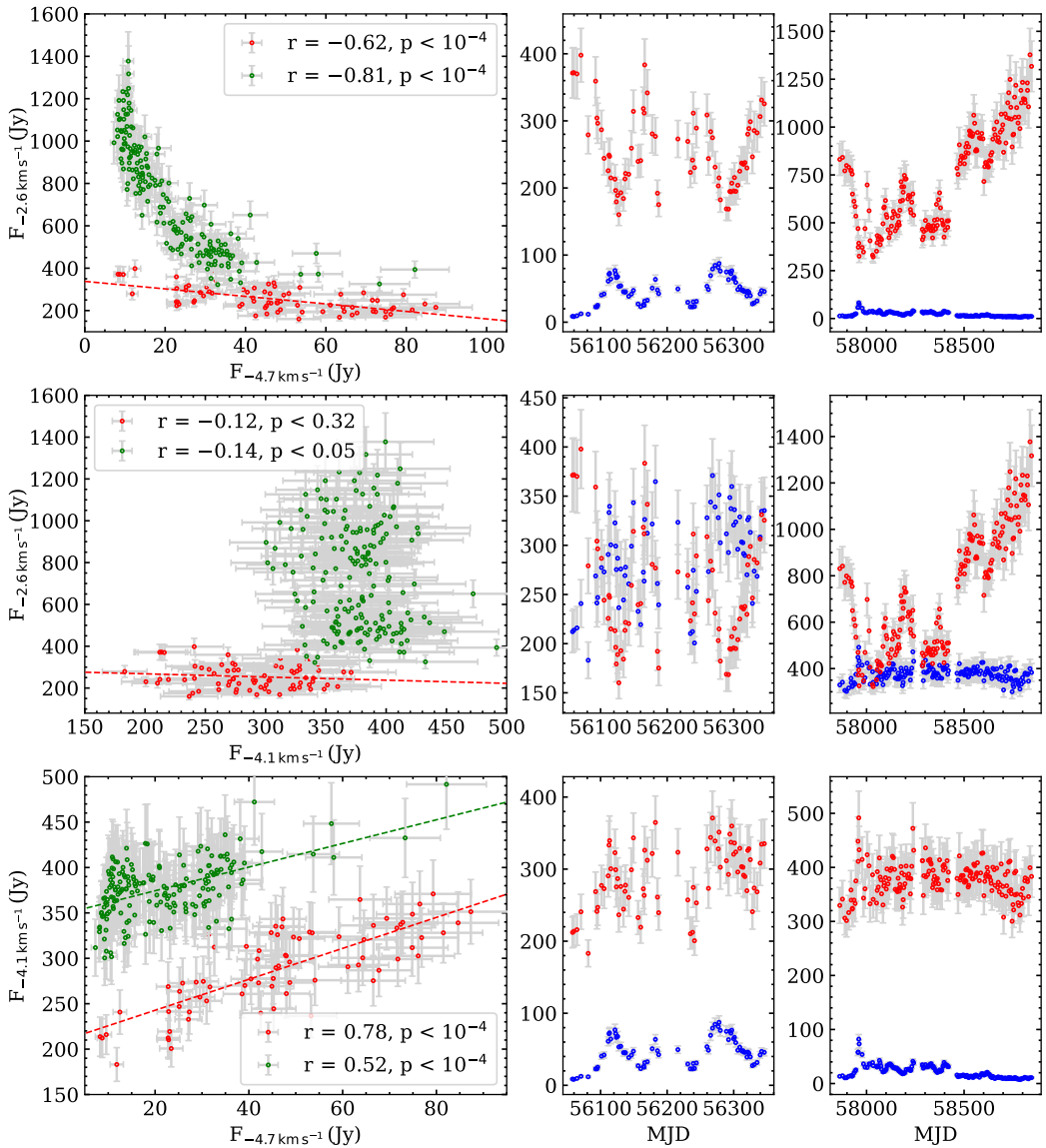
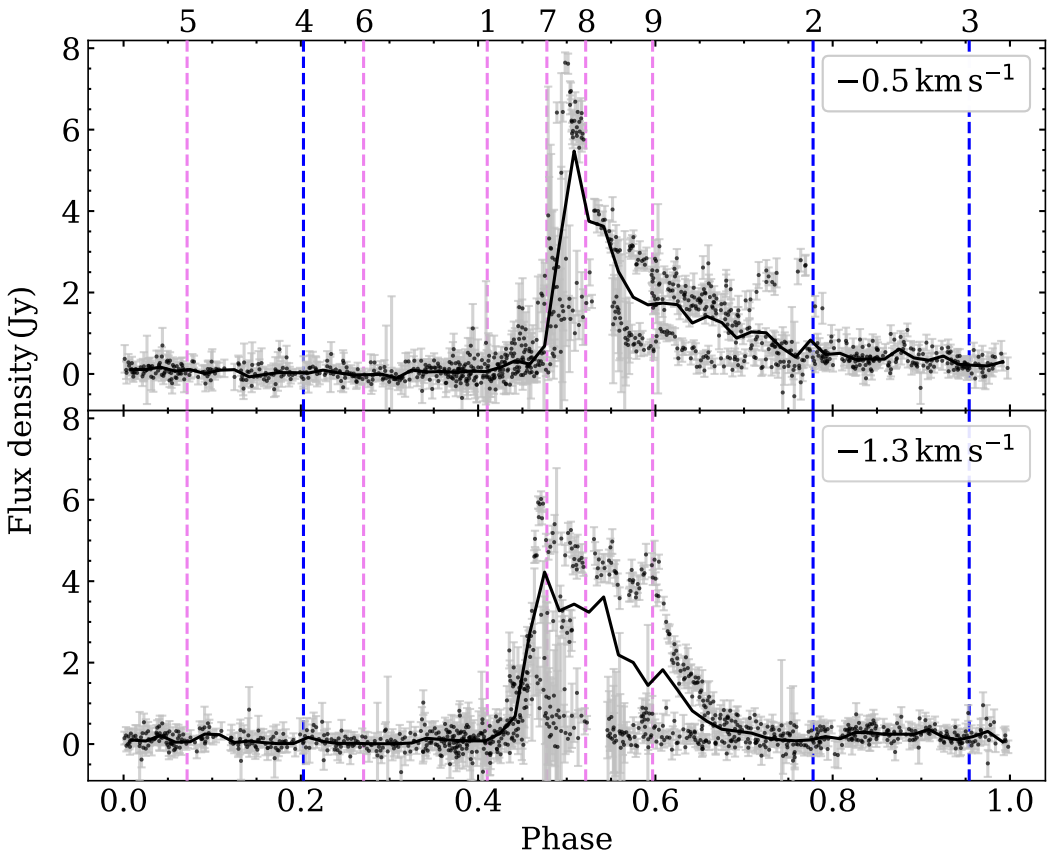
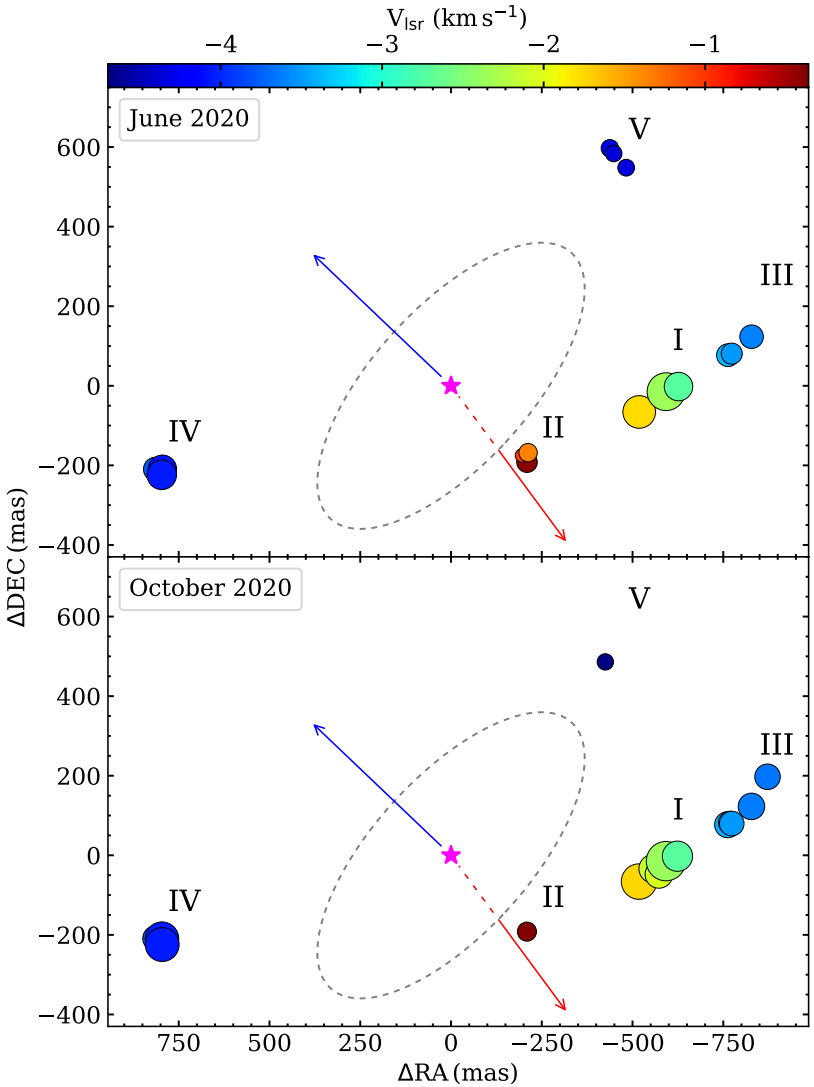

2012-01-15
2020-04-30
average
Flux density (Jy)
Velocity (km s^{-1})
1600
1400
1200
1000
800
600
400
200
0
−6
−5
−4
−3
−2
−1
0


2010
2012
2014
2016
2018
2020
2022
0
−1
−2
−3
−4
−5
Velocity (km s^{-1})
56000
57000
58000
59000
MJD
10^3
10^2
10^1
10^0
Flux density (Jy)


2010
2012
2014
2016
2018
2020
2022
Epoch 5
6
7
8
9
−0.5 km s−1
−1.3 km s−1
−1.8 km s−1
−2.6 km s−1
−3.7 km s−1
−4.1 km s−1
−4.7 km s−1
Flux density (Jy)
MJD
55000
56000
57000
58000
59000

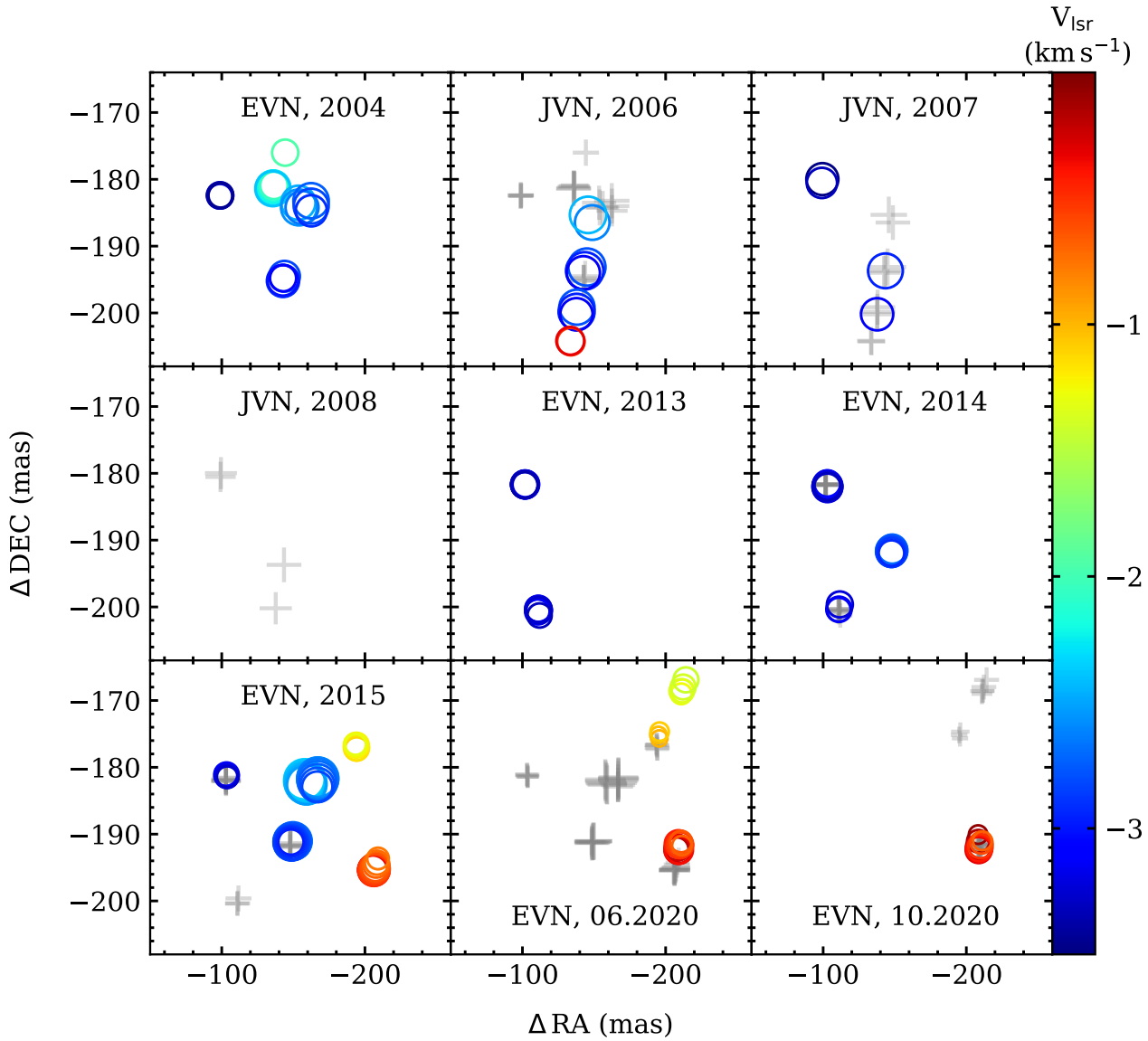

r = −0.62, p < 10^−4
r = −0.81, p < 10^−4
r = −0.12, p < 0.32
r = −0.14, p < 0.05
r = 0.78, p < 10^−4
r = 0.52, p < 10^−4
F−2.6 km s−1 (Jy)
F−4.7 km s−1 (Jy)
F−4.1 km s−1 (Jy)
MJD

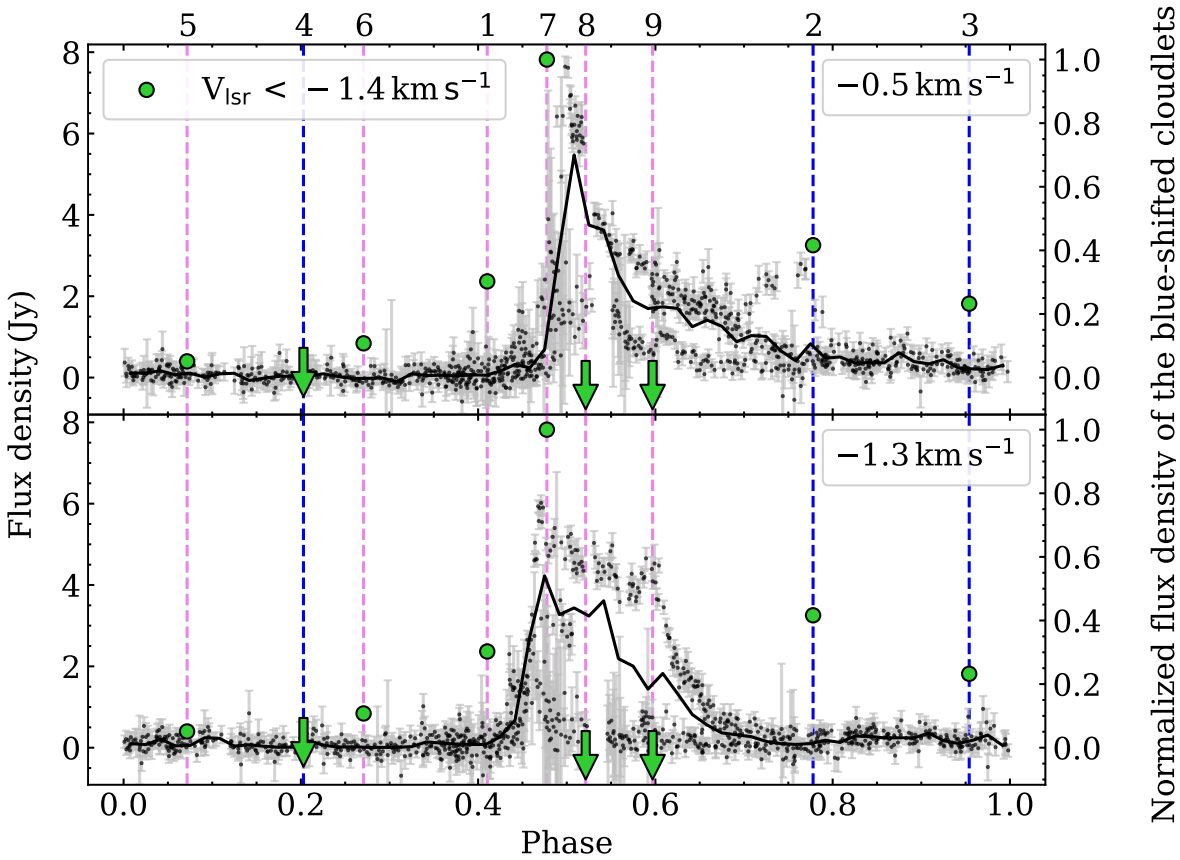

5
4
6
1
7
8
9
2
3
−0.5 km s−1
−1.3 km s−1
Flux density (Jy)
Phase
0.0
0.2
0.4
0.6
0.8
1.0

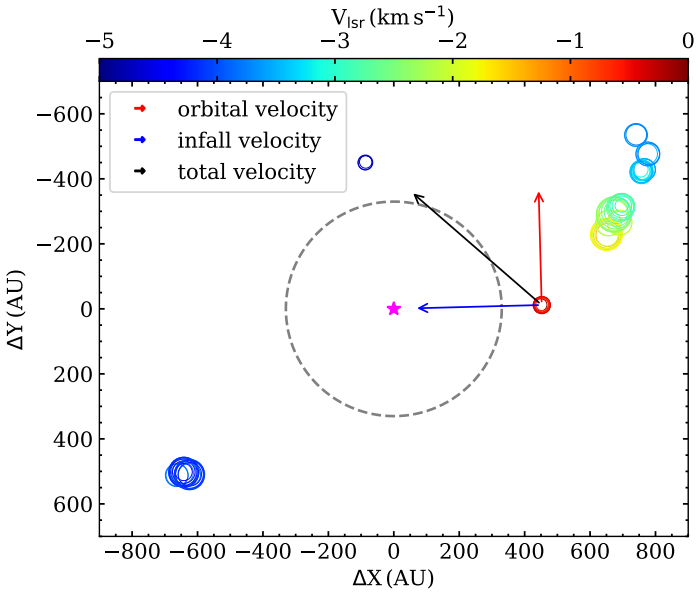


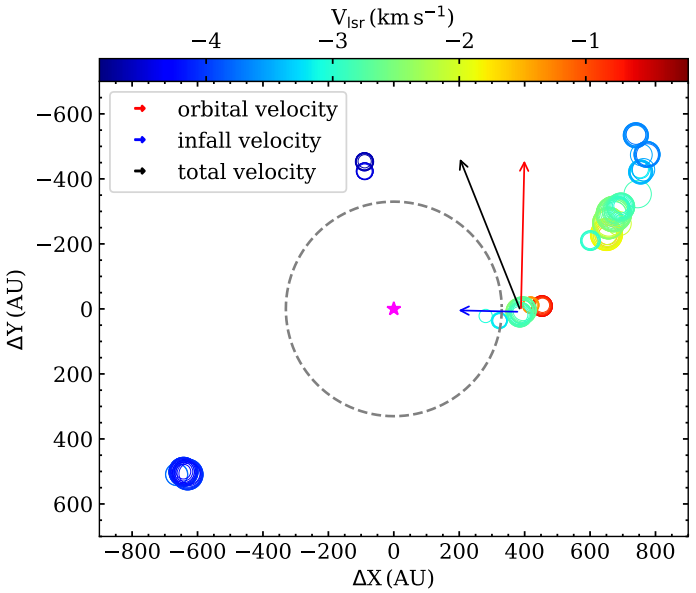
- project: RD002
- ΔV: 0.044 km s^{-1}
- Beam: 7.5 × 3.5 mas

- project: ED048B
- ΔV: 0.088 km s^{-1}
- Beam: 4.5 × 3.8 mas


V_{lsr} (km s^{-1})
EVN, 2004
JVN, 2006
JVN, 2007
JVN, 2008
EVN, 2013
EVN, 2014
EVN, 2015
EVN, 06.2020
EVN, 10.2020
−170
−180
−190
−200
−100
−200
−1
−2
−3
ΔDEC (mas)
ΔRA (mas)

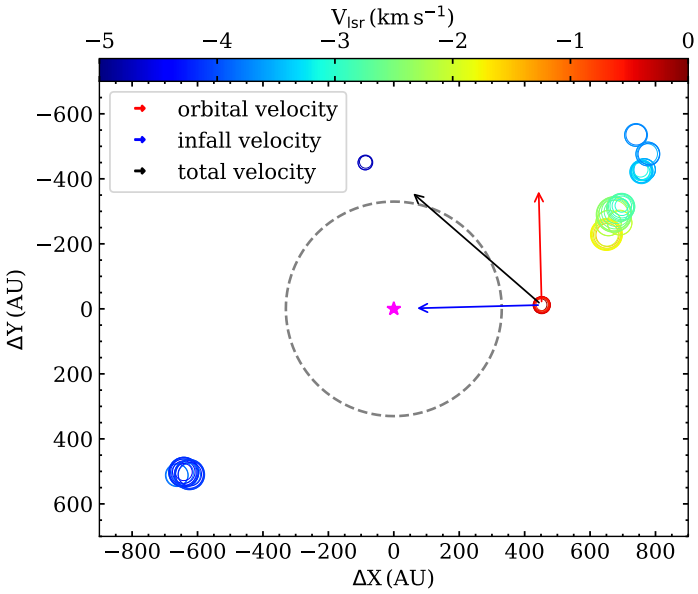

5
4
6
1
7
8
9
2
3
$V_{lsr} < -1.4\,km\,s^{-1}$
$-0.5\,km\,s^{-1}$
$-1.3\,km\,s^{-1}$
Flux density (Jy)
Normalized flux density of the blue-shifted cloudlets
Phase
0.0
0.2
0.4
0.6
0.8
1.0
0
2
4
6
8

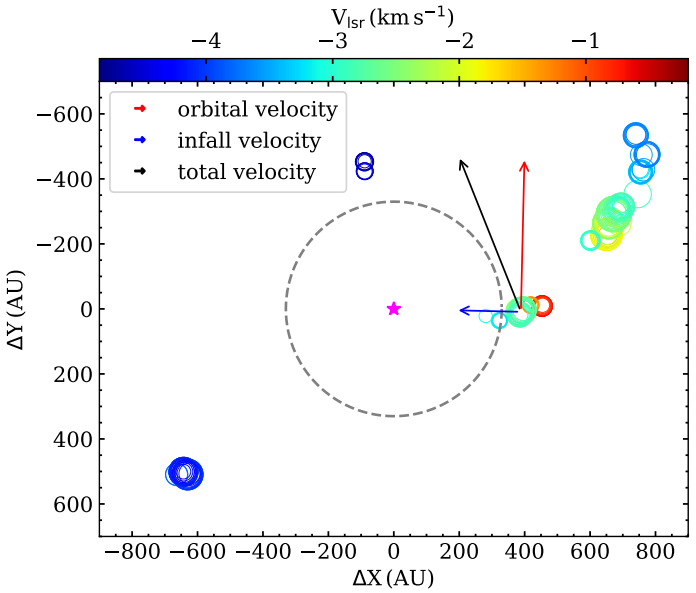




- V_{lsr}: $-0.36\,km\,s^{-1}$
- Orbital velocity: $3.8\,km\,s^{-1}$ (0.85 of Keplerian)
- Infall velocity: $3.9\,km\,s^{-1}$
- data: ED048B, ES071C

- V_{lsr}: $-2.78\,km\,s^{-1}$
- Orbital velocity: $4.7\,km\,s^{-1}$ ($\sim$ Keplerian)
- Infall velocity: $2.0\,km\,s^{-1}$
- data: Sanna et al. 2017





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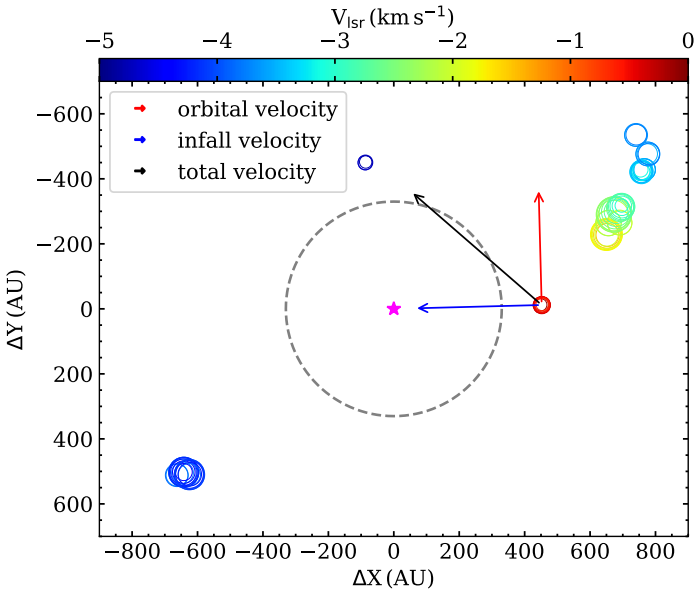

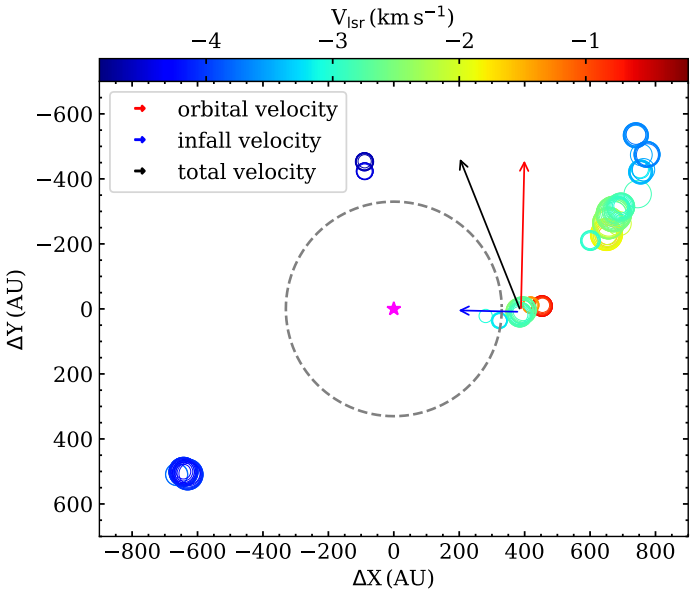

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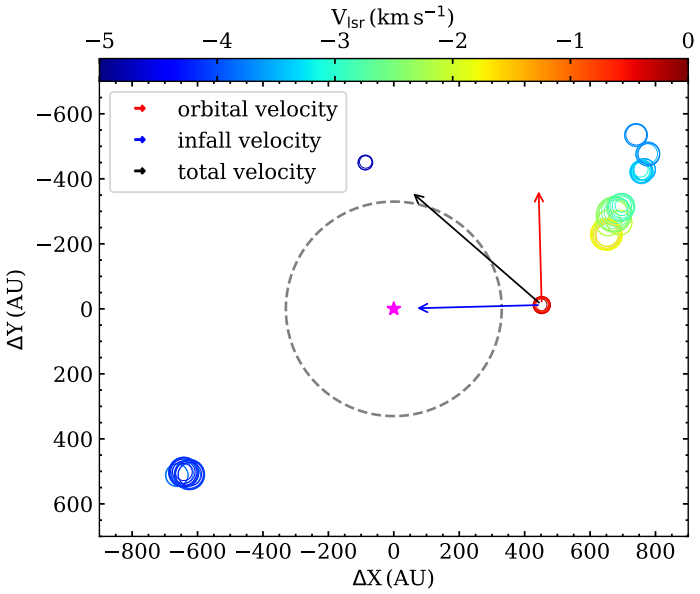

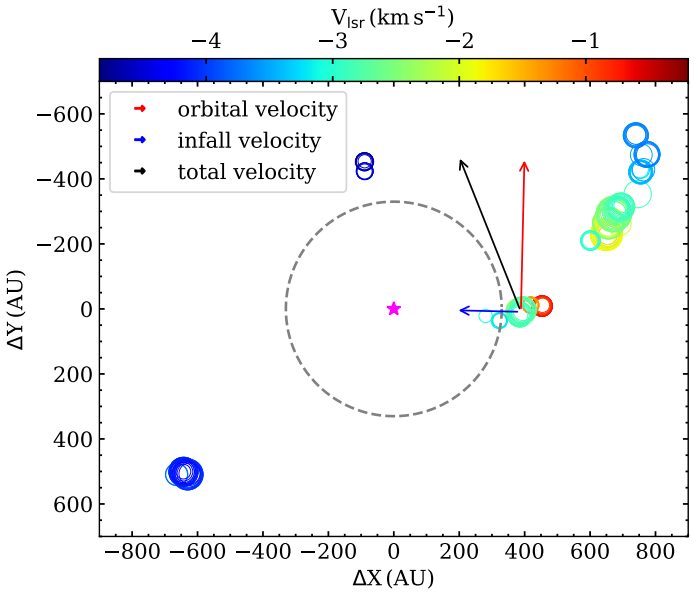

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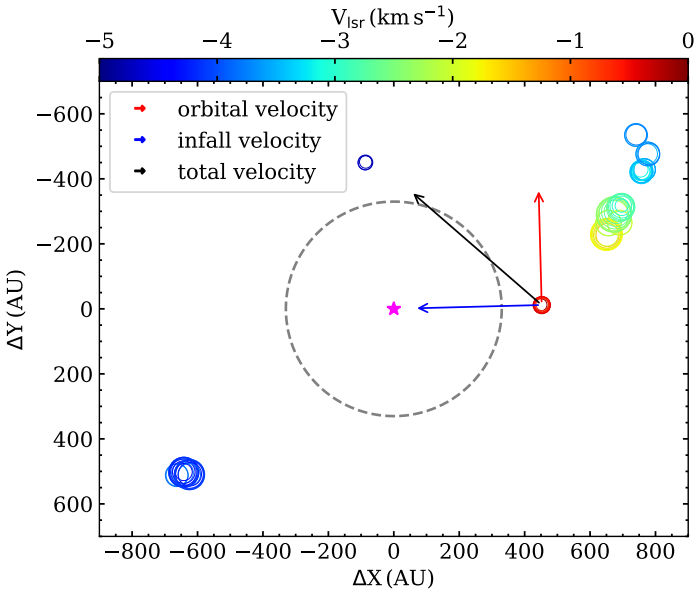

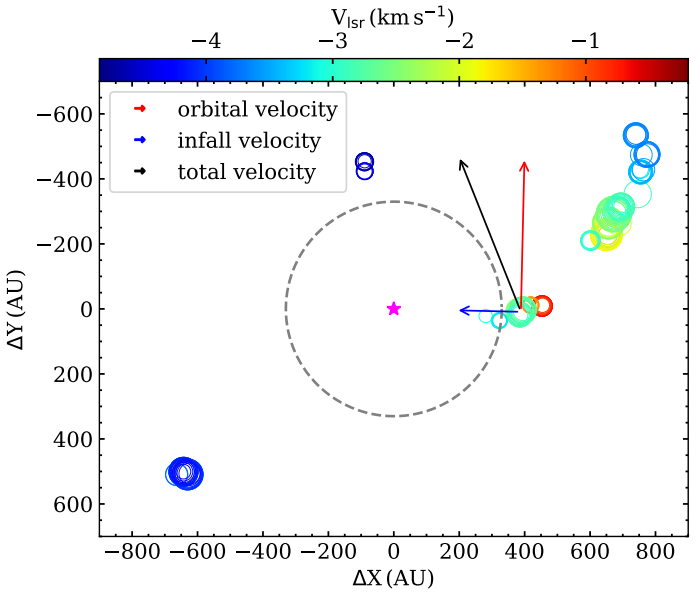

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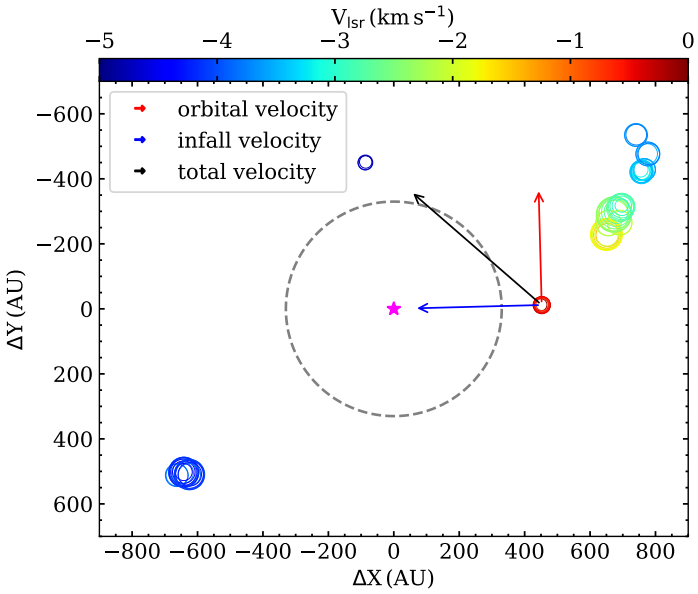

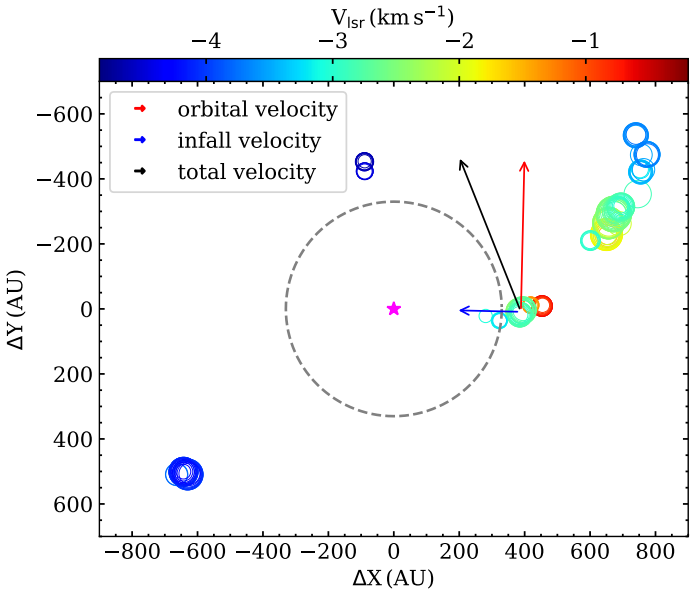

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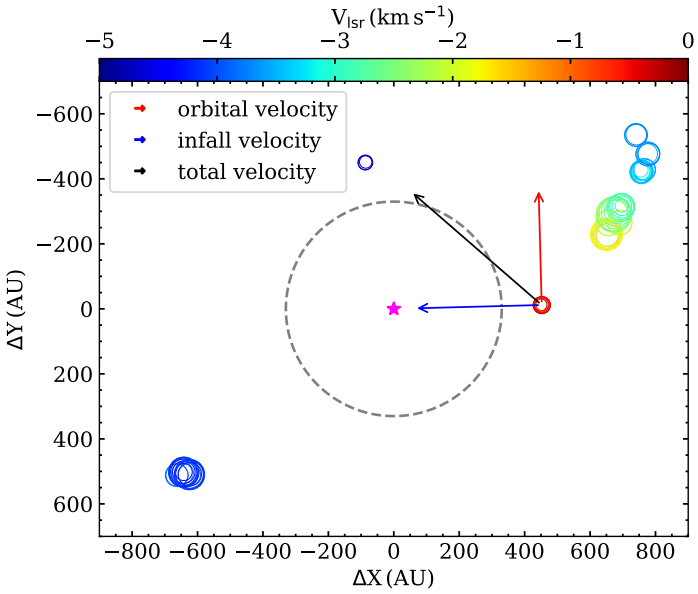

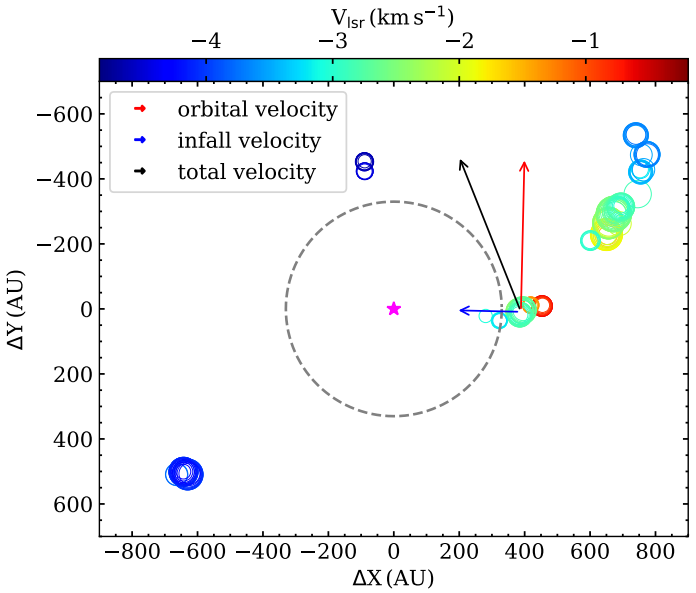

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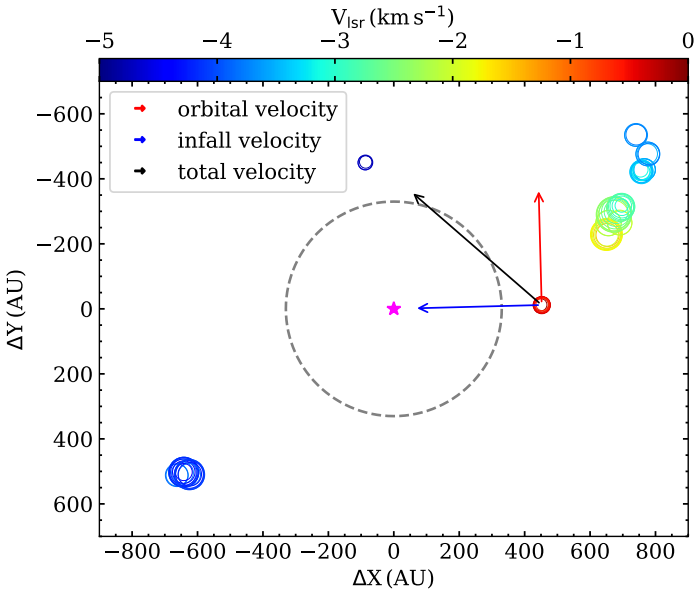

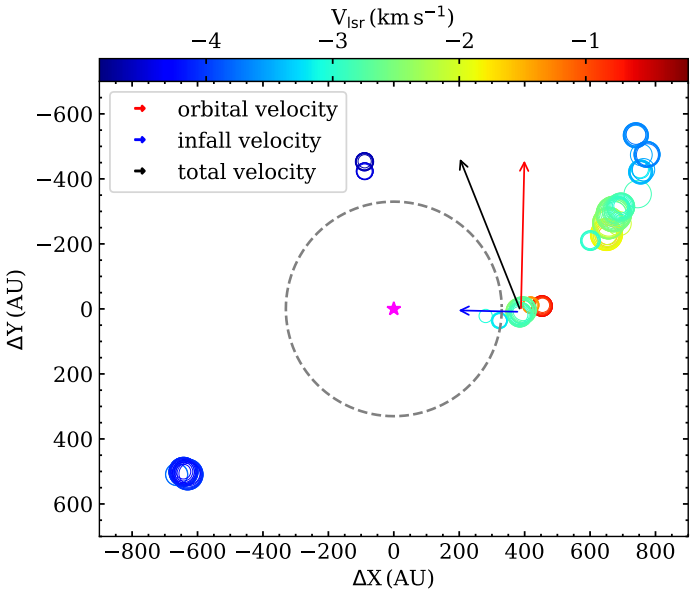

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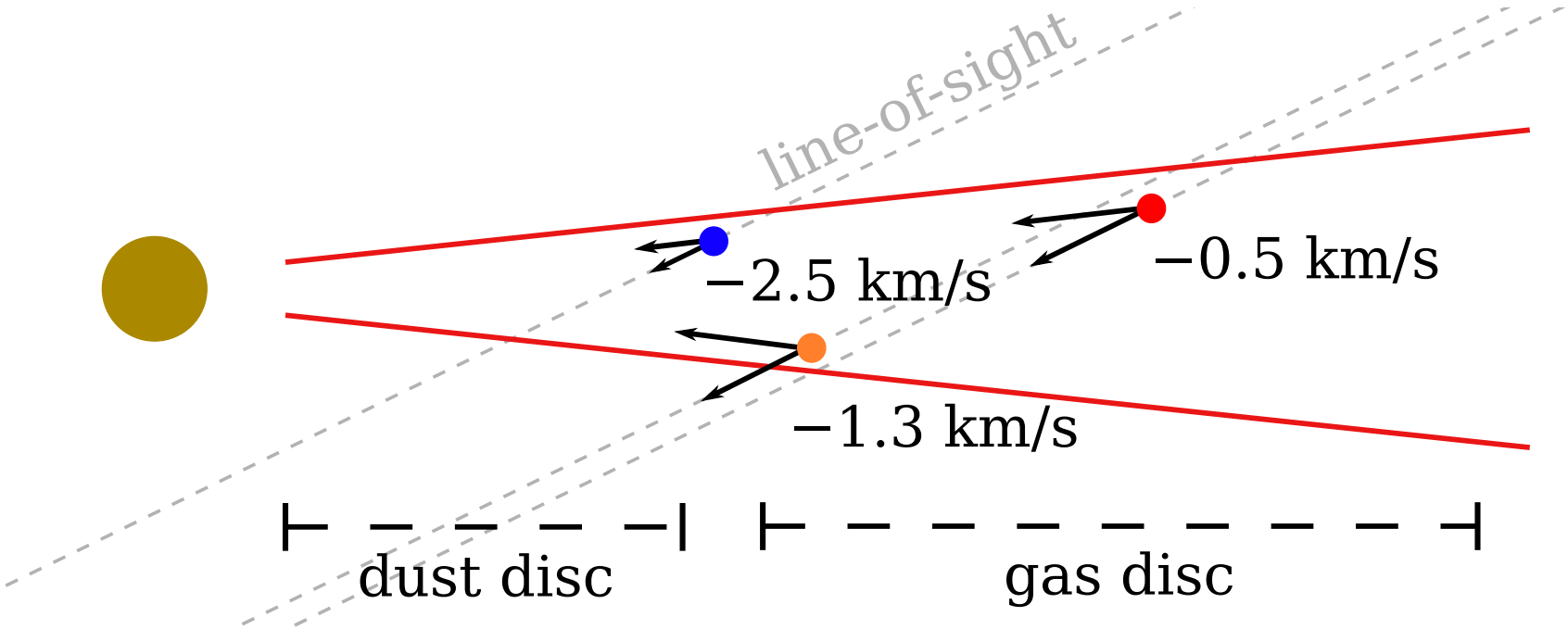
line-of-sight
−2.5 km/s
−0.5 km/s
−1.3 km/s
dust disc
gas disc

- Our observational results confirm an accretion-through-disc scenario.
- Low-amplitude quasi-periodic emission is placed inside cluster II - near the edge of a dust disc.
- Emission of the red-shifted cloudlets is most likely induced by increased flux of the pumping photons due to an increase of a dust temperature.

This work was supported by the Centre of Excellence in Astrophysics and Astrochemistry that is a part of Excellence Initiative - Research University at the NCU in Toruń.

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RESEARCH UNIVERSITY
EXCELLENCE INITIATIVE

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