H₂O Masers in the pre-planetary nebula IRAS 18043–2116

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The post-AGB star IRAS 18043–2116 (OH 009.1–0.4) has long been known to harbor high-velocity H_2O masers. Recent multi-epoch observations using the Very Long Baseline Array allowed for high spatial resolution images of this source. Here we present the results of the first few epochs observed, including the bipolar distribution, and relative proper motions of the H_2O masers. Full analysis of all epochs will yield a distance to IRAS 18043–2116 using trigonometric parallax.



H₂O Masers in the Pre-planetary Nebula



IRAS 18043-2116 F.M. Day¹, Y.M. Pihlström¹, R. Sahai², & M.J. Claussen³ ¹UNM, ³JPL/Caltech, ³NRAO

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tion of the e to the central object ource within the galaxy Peculiar
Parallar

tions, we must model the motion of bject; the residual, presumably linear otion, should be readily separated

Table 1: Properties of Water Fountain PPNs

11634	2 1943A	119134	OH12.8	195552	119190	110043
240	190	100	55	170	130	400
6000	2400	1120	880		2405	>640
152	945	89	50		100	>50
125	50	40	90		59	
Yes	No	Yes	No	No	No	No
6	5	10	15	70	10-13	9-18
1,2	3,4	5		7		9,10
	11634 240 6000 152 125 Yes 6 1,2	110342 W43A 240 180 6000 2400 152 545 125 50 Yes No 6 5 12 3.4	145342 W43A H9134 240 180 190 6000 2400 1120 152 145 89 125 50 40 Yes No Yes 6 5 10 12 24 5	146342 W43A 119134 04128 240 180 150 55 6000 2460 1120 880 152 145 89 58 125 50 49 90 Yes No Yes No 6 5 10 15 6	HS32 W43A HS33 CH12 A HS534 CH12 A HS534 240 80 55 170 600 240 112 800 170 450 240 1120 800 55 170 112 445 80 58 170 125 50 40 90 Yes No 6 5 100 15 100 12 14 5 6 7 12 34 5 6 7 12 34 5 6 7	11523 942.8 1151.3 6412.8 1162.9 1162.9 240 140 150 55 170 00 600 240 112 880 2405 120 112 445 88 80 90 58 102 101 125 50 40 90 58 100 58 100 45 50 40 90 57 70 19-13 46 5 10 15 6 78 10-3 42 54 50 15 70 19-13 10

IRAS 18043-2116

V_{LSR} (km/s)



Figure 1. Spectral and spatial distribution of H₂O masens in IRAS 18043-2116 in epoch 1 (taken 26 October 2008). The bipolar distribution shows the rodder features (+103 km s⁻¹ to +123 km s⁻¹) lying to the biber features (-36 km s⁻¹ to +78 km s⁻¹) lying to the SE.



Figure 2. Relative motion of masses in three epochs. NW features span the velocity range +103 km s⁺ to +157 km s⁺, SE features span the velocity range -66 km s⁺ to +128 km s⁺. The data were taken 28 Oct. 2008, 25 Jan. 2009, and 20 Mar. 2009.

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Figure 3. IRAS, MSX, and Spitzer fluxes of IRAS 18043 2116. At least three different dust components, with different temperatures and masses, are required to fit the data.

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