A Possible New Shower On The Eridanus-Orion Border

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Introduction

- Meteor showers – how many are there?
Search based on 133652 orbits (Šegon, Gural et al. 2013)

- Observational approach – meteor showers as we see them
Based on direction and apparent angular velocity

- Mathematical approach – which meteors can be grouped?
Based on Keplerian orbital parameters

- Interesting case at the Eridanus-Orion border
Three meteor groups found possibly related to 337NUE
One possibly a new meteor shower

337 NUE – nu Eridanids (SonotaCo, 2009)

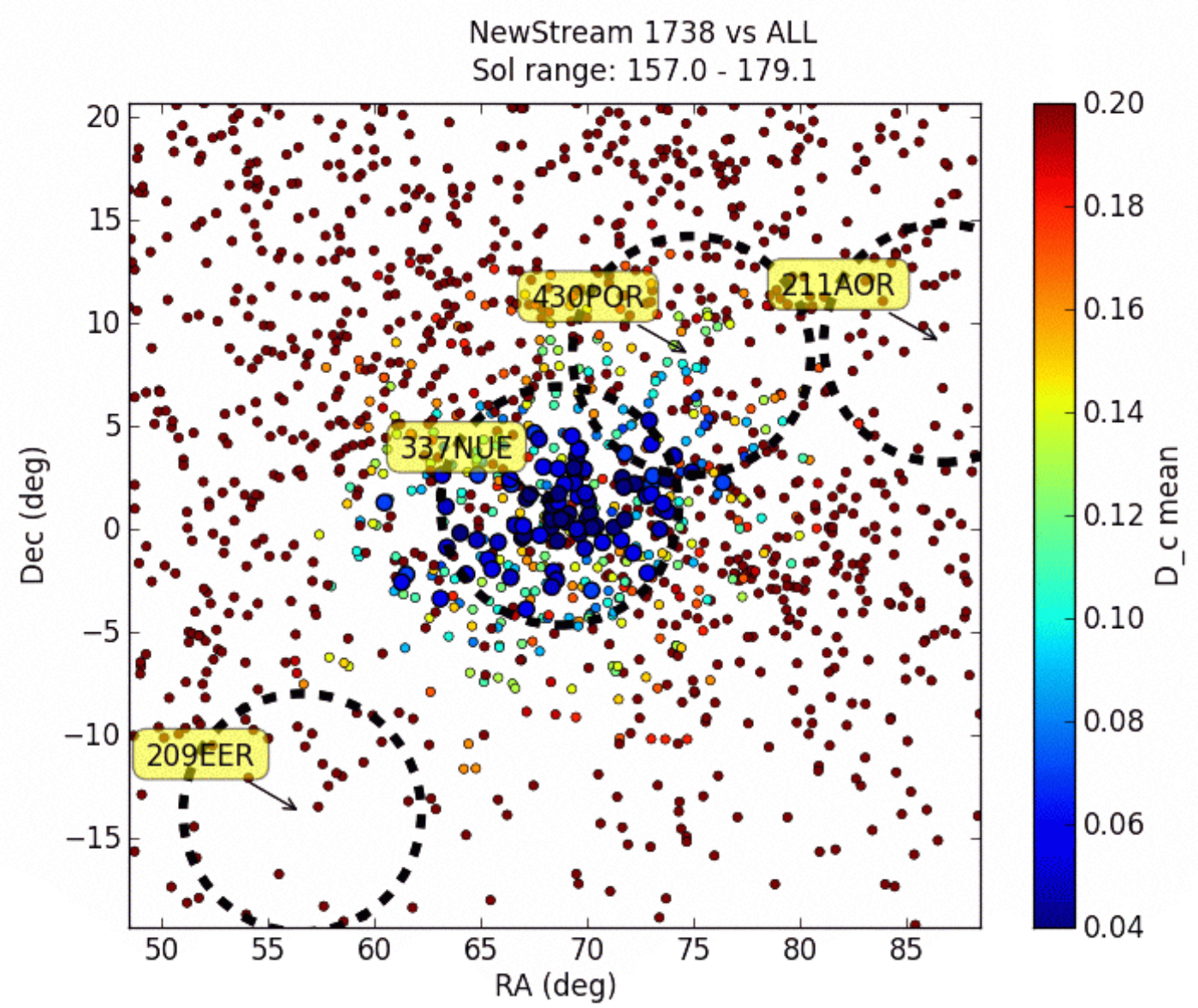
IAU Code	N	$\lambda_{\odot 1}$ [°]	$\lambda_{\odot 2}$ [°]	$\lambda_{\odot p}$ [°]	α_p [°]	δ_p. [°].	$\Delta\alpha$ [°]	$\Delta\delta$ [°]	V_g [km/s]
337 NUE	29	156.8	174.5	167.9	68.7	1.1	0.14	−0.13	65.9

- No mean orbital parameters in IAU MDC base
- Very small radiant drift in RA
- Search found three groups very close to NUE

CMN#	N	Sol-	Sol+	Sol	RA	Dec	dRA	dDec	Vg
1738	89	157.0	179.1	168.6	69.0	0.8	0.70	0.18	66.2
1223	71	149.7	170.7	161.2	65.7	-2.4	0.65	0.17	65.7
1685	46	156.3	175.5	166.3	76.3	-1.3	0.64	0.09	66.5

- #1738 -> almost perfect fit in RA,Dec - radiant drift discrepancies
- #1223 -> very close to #1738, activity periods overlap
- #1685 -> radiant position difference about 10°

CMN#1738 = 337NUE

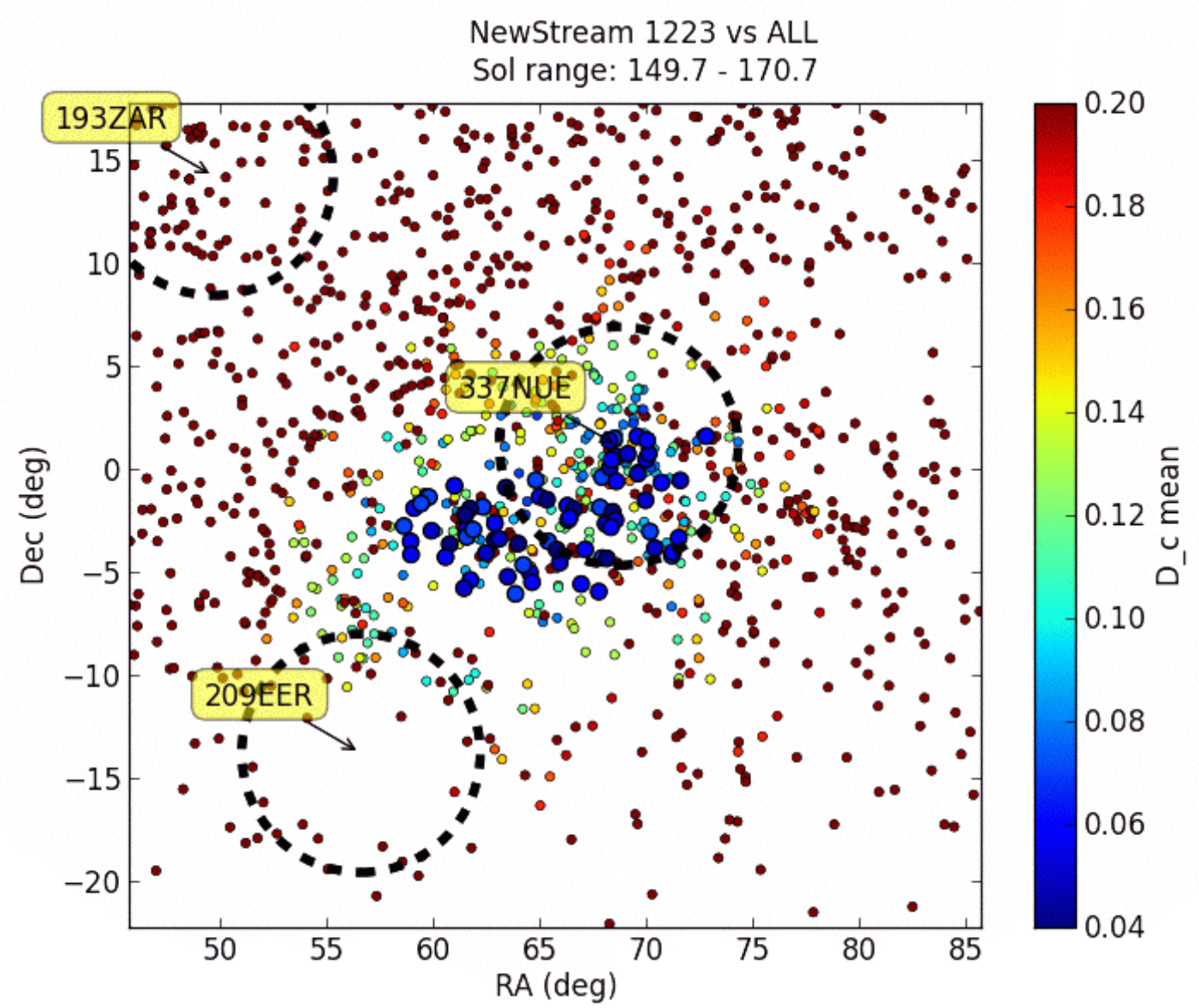


q= 0.909
e= 0.922
i= 142.7
O= 348.6
w= 036.8

RA= 069.0
+0.70 daily

Dec= 000.8
+0.18 daily

CMN#1223 = ?

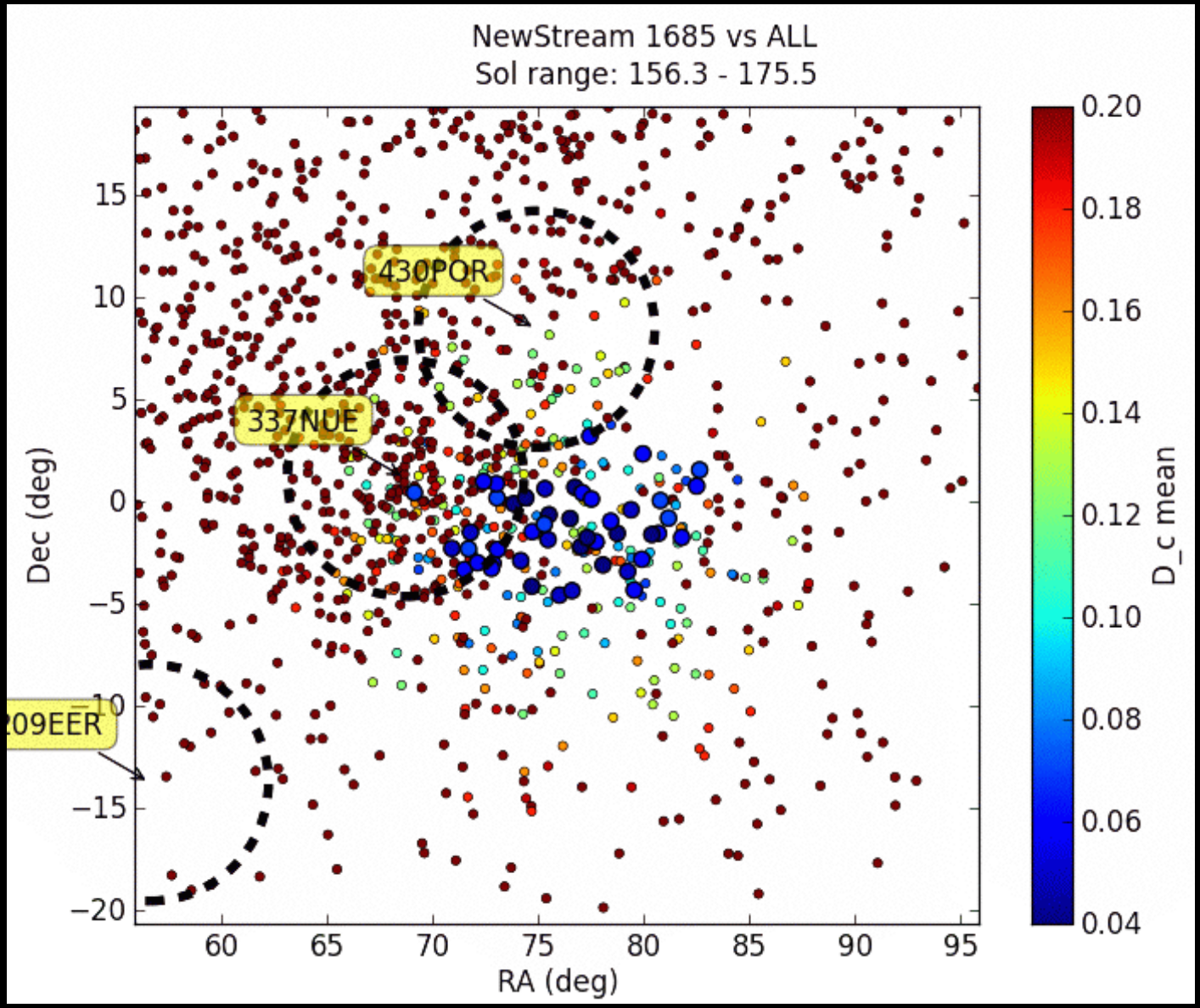


q= 0.959
e= 0.910
i= 138.9
O= 341.2
w= 025.6

RA= 065.7
+0.65 daily

Dec= -02.4
+0.17 daily

CMN#1685 = ???



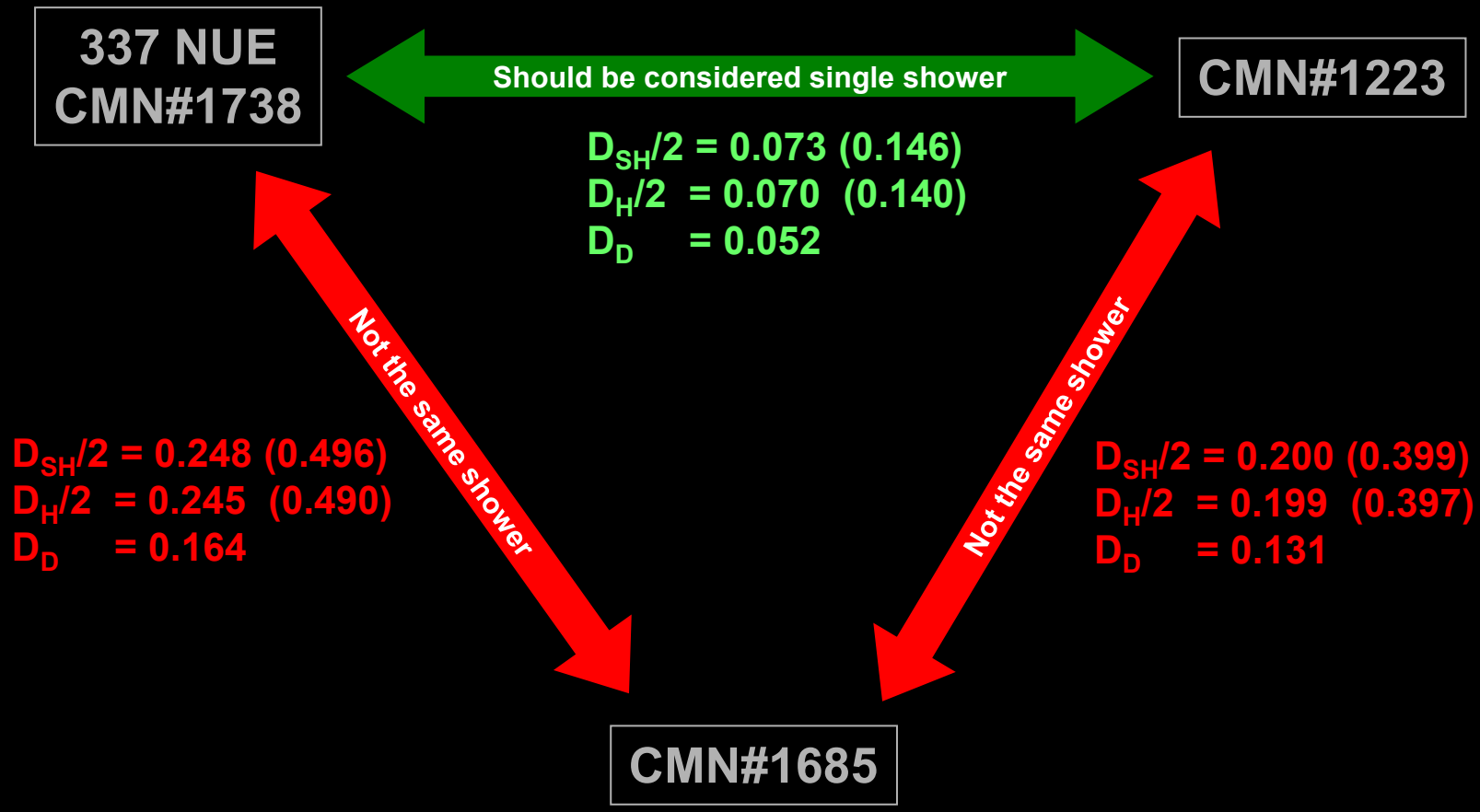
q= 1.003
e= 0.944
i= 139.0
O= 346.3
w= 005.1

RA= 076.3
+0.64 daily

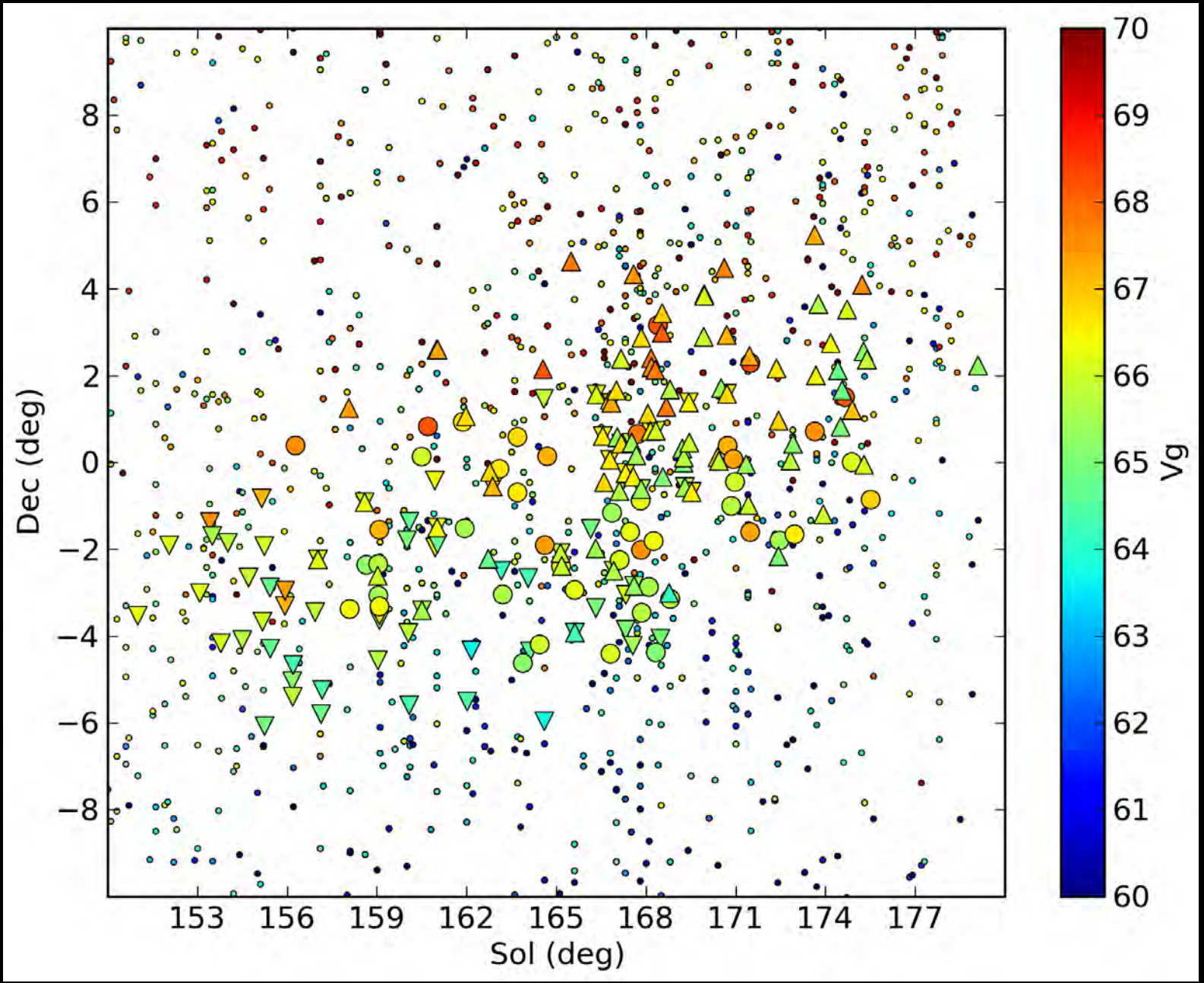
Dec= -01.3
+0.09 daily

D-criteria results when comparing the three groups

	q	e	i	Ω	w
CMN#1738	0.909	0.922	142.7	348.6	036.8
CMN#1223	0.959	0.910	138.9	341.2	025.6
CMN#1685	1.003	0.944	139.0	346.3	005.1



solar longitude vs Dec – Vg color coded



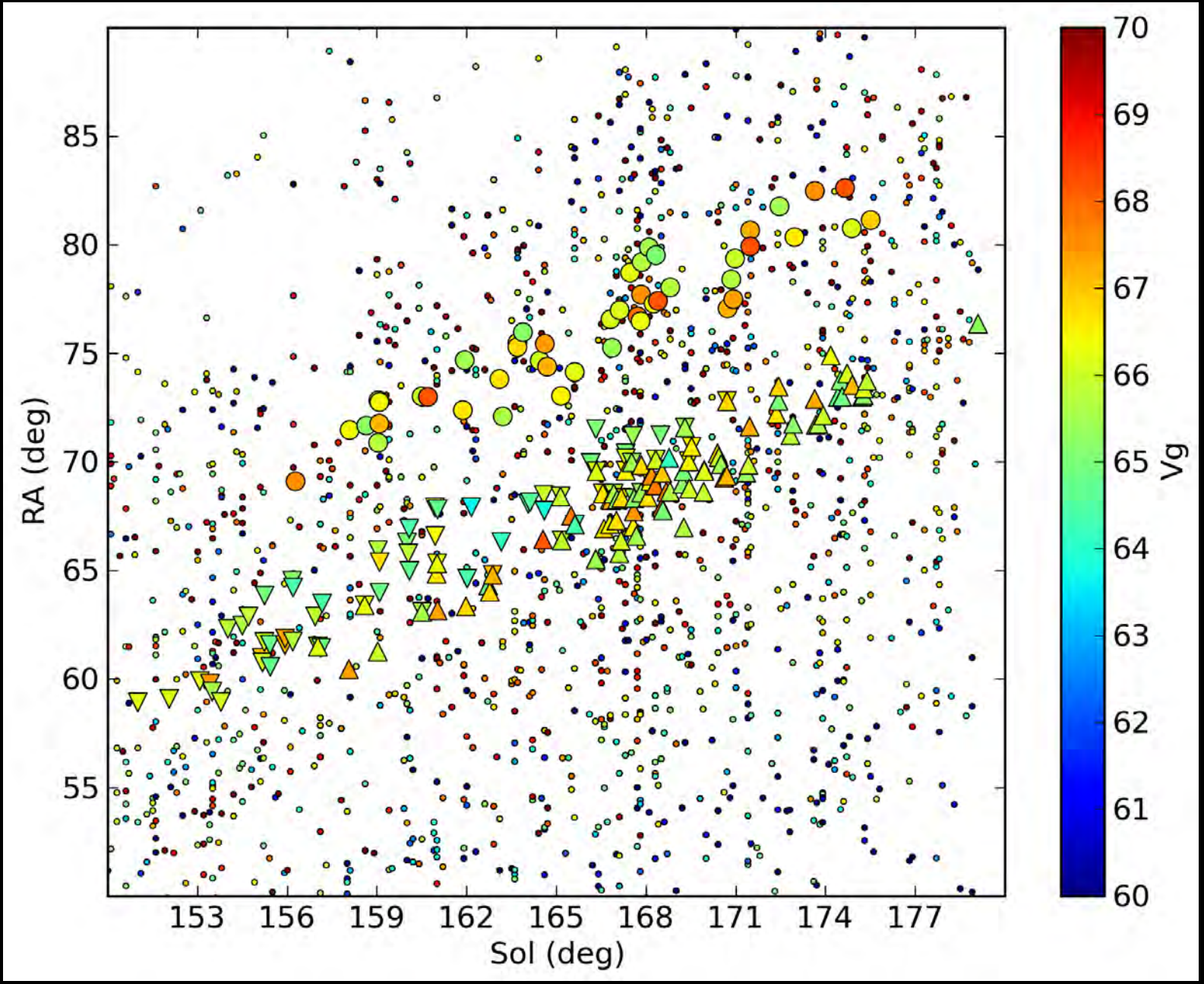
#1685

#1738

#1223

#1738
#1223

solar longitude vs RA – Vg color coded



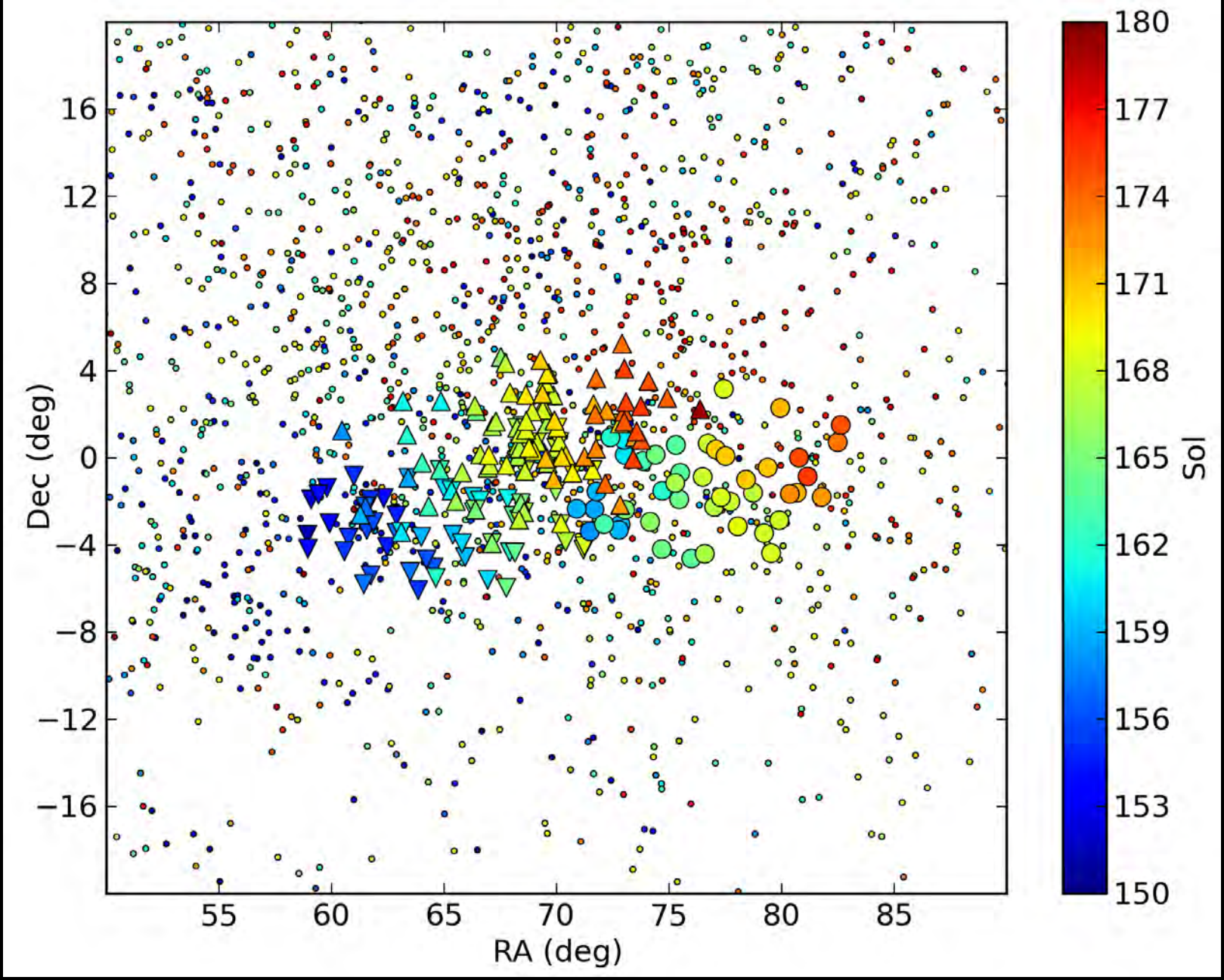
○ #1685

△ #1738

▽ #1223

⧖ #1738 #1223

RA vs Dec - solar longitude color coded



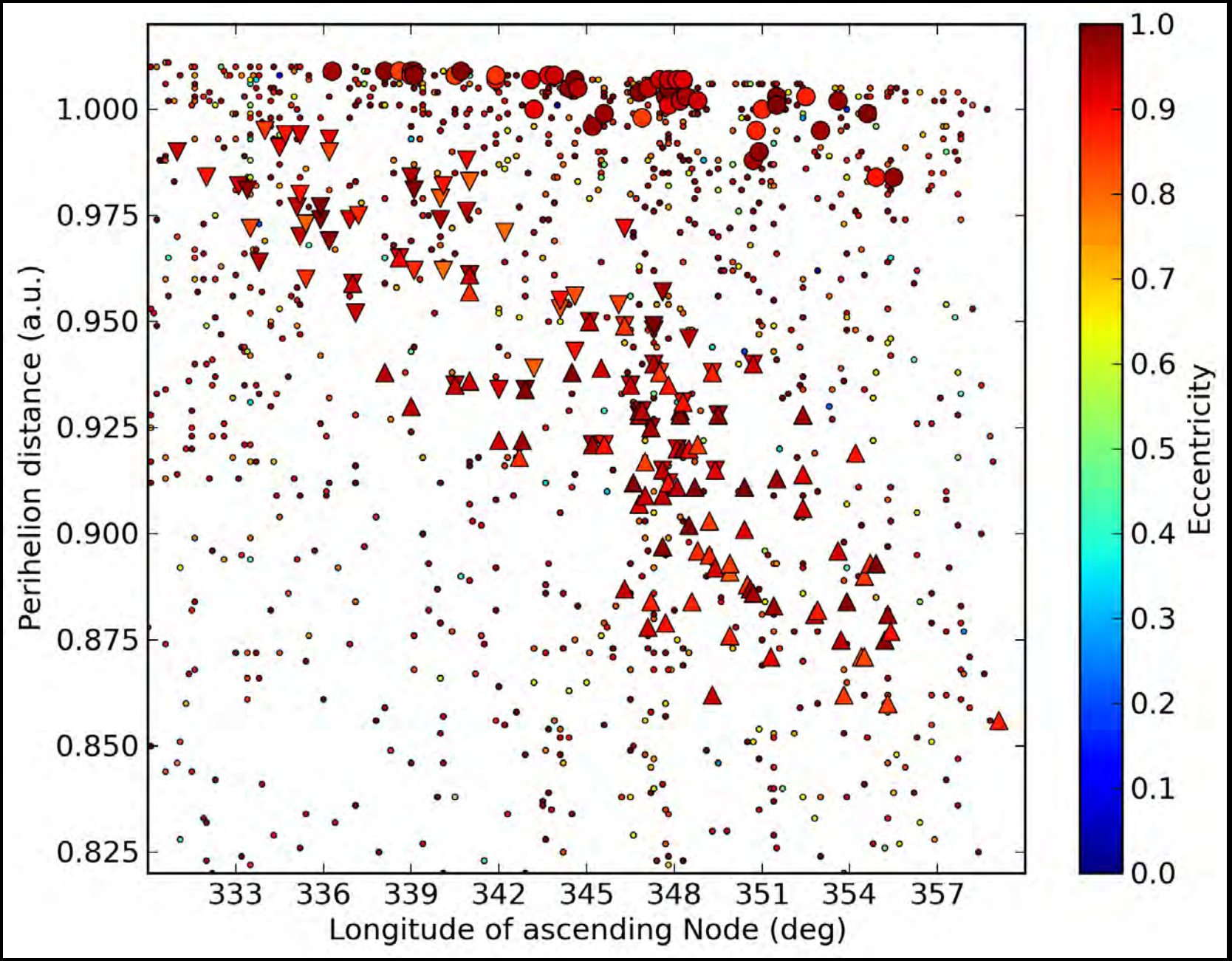
#1685

#1738

#1223

#1738
#1223

asc. node vs perihelion distance – e color coded



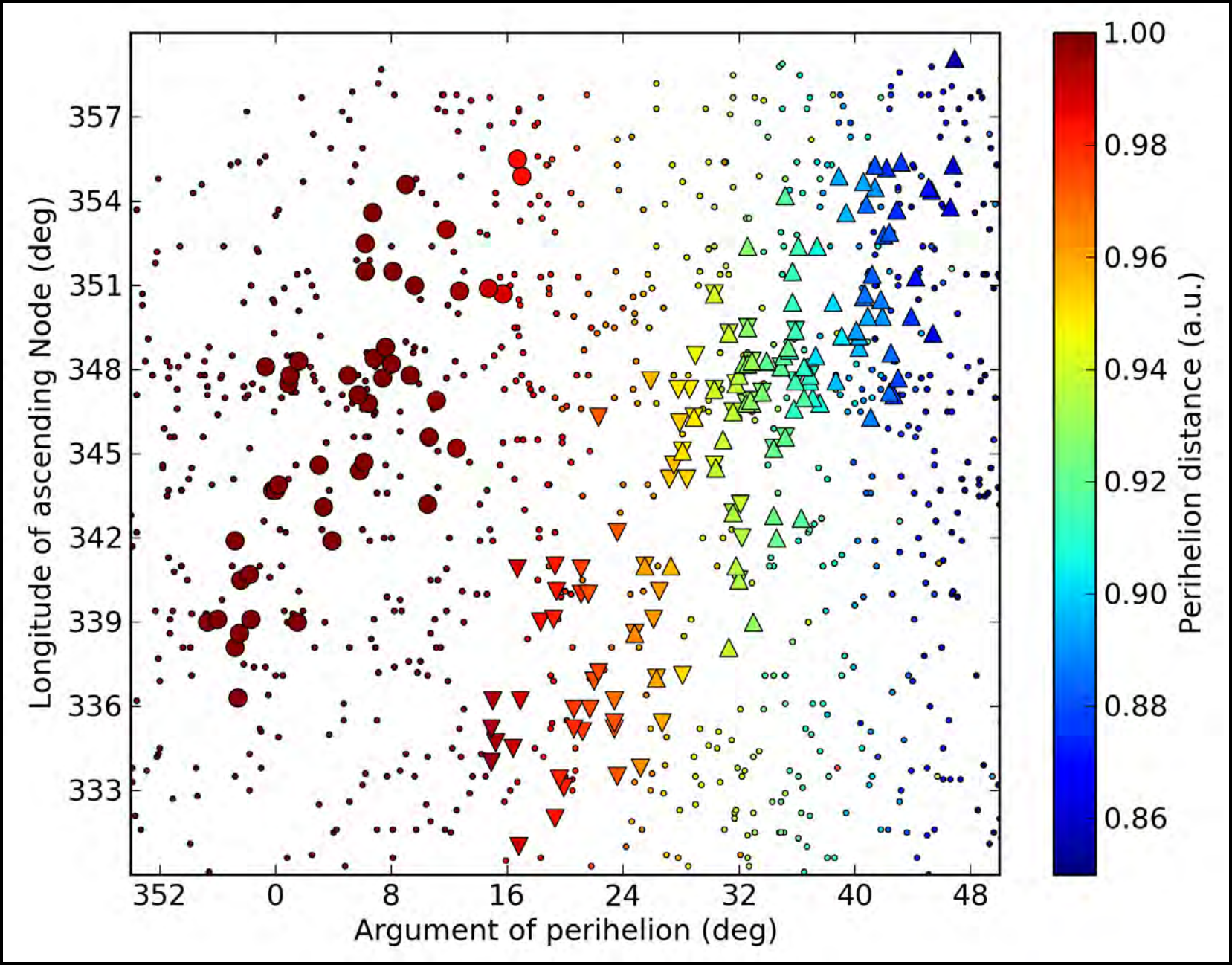
○ #1685

△ #1738

▽ #1223

⧖ #1738 #1223

argument of perihelion vs asc. node – q color coded



○ #1685

△ #1738

▽ #1223

⧖ #1738 #1223

Conclusions

- pi6 Orionids (IAU 552 PSO) = CMN#1685
  a possible new shower
- nu Eridanids (337 NUE) = CMN#1758 & CMN#1223
  “duality” due to small amount of data?
- Detailed analysis from more observations
- Confirmation from other databases needed

Acknowledgements

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Thank you for your attention!

Questions?