New chemo-dynamical properties of dwarf spheroidal galaxies in the Milky Way and Andromeda

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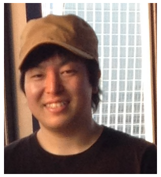

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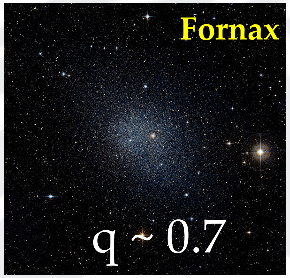
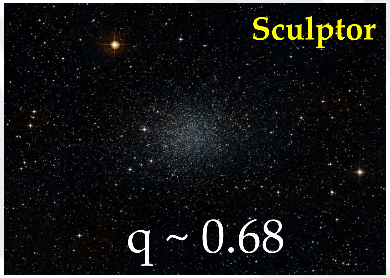
DATA: Axial ratio, Sky position, and σ_los





MODEL:

Axisymmetric stellar and dark halo mass profile

$$\rho(R,z) = \rho_0 \left(\frac{m}{b_{\rm halo}}\right)^{\alpha} \left[1 + \left(\frac{m}{b_{\rm halo}}\right)^2\right]^{-(\alpha+3)/2} \qquad m^2 = R^2 + \frac{z^2}{Q^2}$$

Q : DM's axial ratio

Axisymmetric Jeans eqs.

$$\overline{v_z^2} = \frac{1}{\nu(R,z)} \int_z^{\infty} \nu \frac{\partial \Phi}{\partial z} dz \qquad \overline{v_\phi^2} = \frac{1}{1-\beta_z}\left[\overline{v_z^2} + \frac{R}{\nu}\frac{\partial(\nu \overline{v_z^2})}{\partial R}\right] + R\frac{\partial \Phi}{\partial R}$$

$$\beta_z = 1 - \overline{v_z^2}/\overline{v_R^2}$$

RESULTS:

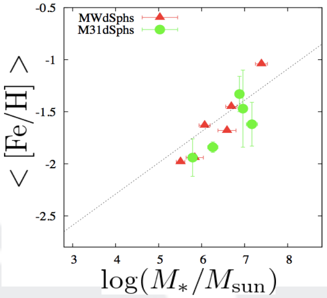
1. Dark halos in the MW and M31 dwarf satellites

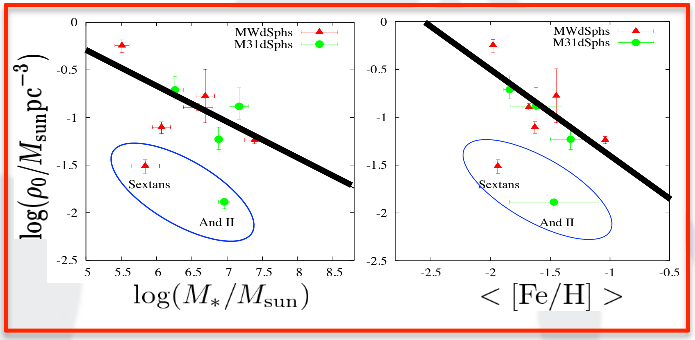
- NOT spherical but FLATTENED system. These halos may be more flattened than CDM-based N-body predictions.
- NOT all of their dark halos have a CORED central density profile.
- The best fit results for halo parameters are

Galaxy	Q	$b_{\rm halo}$[pc]	$M(r_{\rm half})[10^7 M_\odot]$	$M_{300}[10^7 M_\odot]$	β_z	α	i [deg]
MW dSphs							
Carina	0.62 ± 0.03	$402.5^{+37.1}_{-30.9}$	0.71 ± 0.03	1.21 ± 0.09	0.33 ± 0.04	$0.00_{-0.14}$	[illegible]
Fornax	0.50 ± 0.03	$1146.9^{+100.5}_{-80.3}$	7.22 ± 0.26	0.97 ± 0.16	0.18 ± 0.05	[illegible]	[illegible]
Sculptor	0.38 ± 0.03	$670.7^{+57.7}_{-49.3}$	1.32 ± 0.05	1.88 ± 0.09	[illegible]	[illegible]	$85.4^{+4.90}_{-5.70}$
Sextans	0.83 ± 0.12	$747.2^{+73.1}_{-50.1}$	2.32 ± 0.22	0.33 ± 0.04	[illegible]	$0.00_{-0.22}$	$89.6^{+0.40}_{-10.2}$
Draco	0.37 ± 0.05	$329.3^{+58.0}_{-34.8}$	1.36 ± 0.13	[illegible]	$-0.20^{+0.17}_{-0.24}$	$0.00_{-0.21}$	$88.4^{+1.40}_{-14.8}$
Leo I	1.25 ± 0.20	$254.7^{+121.2}_{-73.1}$	[illegible]	[illegible]	$0.21^{+0.14}_{-0.25}$	$-1.03^{+0.32}_{-0.22}$	$88.0^{+2.00}_{-19.4}$
Leo II	0.58 ± 0.05	$668.2^{+219.1}_{-80.7}$	[illegible]	0.75 ± 0.17	$0.05^{+0.08}_{-0.13}$	$0.00_{-0.13}$	$82.6^{+7.40}_{-13.8}$
M31 dSphs							
And I	[illegible]	[illegible]	$5.76^{+0.87}_{-0.69}$	0.67 ± 0.12	$0.80^{+0.03}_{-0.07}$	$-0.05^{+0.05}_{-0.23}$	$89.1^{+0.90}_{-24.2}$
[illegible]	[illegible]	$1539.1^{+165.9}_{-51.6}$	$6.35^{+0.23}_{-0.41}$	0.14 ± 0.02	$0.66^{+0.02}_{-0.04}$	$0.00_{-0.06}$	$90.0_{-13.8}$
[illegible]	0.17 ± 0.02	$746.8^{+156.9}_{-128.8}$	$5.49^{+0.62}_{-0.59}$	2.71 ± 0.39	$0.14^{+0.08}_{-0.11}$	$-0.26^{+0.26}_{-0.30}$	$88.9^{+1.10}_{-9.26}$
And V	$2.44^{+0.78}_{-0.60}$	≥ 380.2	$1.57^{+0.14}_{-0.15}$	1.25 ± 0.25	≤ 0.03	$-1.51^{+0.14}_{-0.13}$	$80.7^{+9.27}_{-12.3}$
And VII	$1.95^{+0.23}_{-0.20}$	$514.6^{+89.4}_{-104.4}$	$8.36^{+0.82}_{-0.78}$	1.21 ± 0.43	$0.45^{+0.06}_{-0.08}$	$-0.07^{+0.07}_{-0.40}$	$87.2^{+2.80}_{-25.6}$

Please come see my poster ! and check it out !!

2. NEW chemo-dynamical properties of dSphs





Although available data of dSphs is not enough to conclude, we suggest the link between **the central density of their dark halos** and **stellar mass and metallicity**.