RC Atlas: Rotation Curve Decomposition for Size-Mass Relations of Bulge, Disk, and Dark Halo in Spiral Galaxies

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Abstract

Rotation curves of 145 spiral galaxies used in "Rotation curve decomposition for size-mass relations of bulge, disk and dark halo in spiral galaxies", as compiled from the literature are shown in this supplement. Ascii formated tables of the rotation curves are given on the same web page.

Key words: dark matter — galaxies: haloes — galaxies: kinematics and dynamics — galaxies: rotation curve — galaxies: spiral — galaxies: structure

1. Compilation Atlas of Rotation Curves and Decomposion

Rotation curves used in the decomposition were compiled from the literature, and are shown in figure 1 for 145 spiral galaxies. The data from the other authors were read from their figures in the literature using a graphreading tool. The accuracy of the reading was about ± 0.2 kpc in radius and ± 3 km s⁻¹in velocity, which are smaller than the fitting accuracy and/or the dispersion among the data. We applied the Gaussian averaging procedure to individual curves, and regridded and smoothed the data using the method described in Sofue (2013, 2015). The smoothed rotation curves were used for the fitting. Machine-readable rotation curves are available at url http://www.ioa.s.u-tokyo.ac.jp/~sofue/.

The references to the data are as follows according to galaxy names which are so given that NGC, IC and UGC numbers are added by numbers of six digits as 100000 to 900000 corresponding to the references as below. For statistics, we used rotation curves whose observed end radii are greater than 10 kpc in order to obtain a sufficient accuracy for the decomposition. The references to the data are:

- 100000: Sofue (1999) from the nearby galaxy RC catalogue by NGC number except for the Galaxy as 0000 and IC342 as 0342. RCs for the Milky Way and M31 were taken from Sofue (2015);
- 200000: Sofue et al. (2003) from the Virgo galaxy CO survey catalogue by NGC number;
- 300000: Individual galaxies as given in the caption of figure 4.
- 400000: Marquez et al. (2004) from the isolatedgalaxies survey by NGC number. Rotation velocities hereafter were read from figures in the reference by using a graph-reading tool. The data were smoothed by Gaussian-running averaging to yield rotation curves with equal logarithmic increment of 0.1 dex.;

- 500000: de Blok et al. (2008) from the THINGS survey by NGC and/or IC numbers.
- 600000: Garrido et al. (2005) from the GHASP survey by UGC number.
- 700000: Noordermeer et al. (2007) from the early galaxy survey by UGC number;
- 800000: Swaters et al. (2009) from the dwarf and low-surface-luminosity galaxy survey by UGC number;
- 900000: Martinsson et al. (2013) from the DiskMass survey by UGC number.

Individual rotation curves are shown in figure 2 to 10 by thick grey lines. The uppermost thin lines are the fitted rotation curves. Fitted velocity components for bulge, disk and dark halos are shown by thin lines. 9



Fig. 1. Rotation curves analyzed in this paper. References are, in the order of panel numbers. (1) Sofue et al. (1999): Nearby galaxy rotation curve atlas; (2) Sofue et al. (2003): Virgo galaxy CO line survey; (3) Sofue et al. (1999: NGC 253 revised); Ryder et al. (1998, NGC157); Hlavacek-Larrondo et al. (2011a: NGC253; 2011b: NGC 300); Erroz-Ferrer et al. (2012: NGC 864); Gentile et al. (2015: NGC 3223); Olling R. P. (1996: NGC 4244); Whitmore & Schweizer (1987: NGC 4650A); Gentile et al. (2007: NGC 6907); (4) Marquez et al. (2004): Isolated galaxy survey; (5) de Blok et al. (2008): THINGS survey, where dashed galaxies are included in (1) and were not used in the analysis; (6) Garrido et al. (2005): GHASP survey; (7) Noordermeer et al. (2007): Early type spiral survey; (8) Swaters et al. (2009): Dwarf and low-surface-brightness galaxy survey; and (9) Martinsson et al. (2013): DiskMass survey.



Fig. 2. Rotation curves from Sofue et al. (1999: Nearby galaxies RC catalogue; abbreviated by digit number 100000), and results of decomposition.



Fig. 3. Same as figure 2, but galaxies from Sofue et al. (2003: Virgo CO survey; 200000).



Fig. 4. Same as figure 2, but galaxies (abbreviated by six digit number 300000) that were obtained by combining data from Sofue et al. (1999: NGC 253); Ryder et al. (1998, NGC157); Hlavacek-Larrondo et al. 2011a, NGC253; 2011b, NGC 300); Erroz-Ferrer et al. (2012, NGC 864); Gentile et al. (2015 NGC 3223 (Not smoothed)); Olling R. P. (1996, NGC 4244); Whitmore & Schweizer (1987, NGC 4650A); Scarano et al. (2008, NGC 6907); Gentile et al. (2007, NGC 6907).



Fig. 5. Same as figure 2 but for galaxies from Marquez et al. (2004: Isolated galaxies survey; 400000).



Fig. 6. Same as figure 2 but for galaxies from de Blok et al. (2008: THINGS; 500000). Overlapped galaxies with Sofue (1999) are not included.



Fig. 7. Same as figure 2 but for galaxies from Garrido et al. (2005: GHASP; 600000).



Fig. 8. Same as figure 2 but for galaxies from Noordermeer (2009: Early type galaxies; 700000).



Fig. 9. Same as figure 2 but for galaxies with from Swaters et al. (2013: Dwarfs; 800000).



Fig. 10. Same as figure 2 but for galaxies from Martinson et al. (2013: DiskMass survey; 900000)