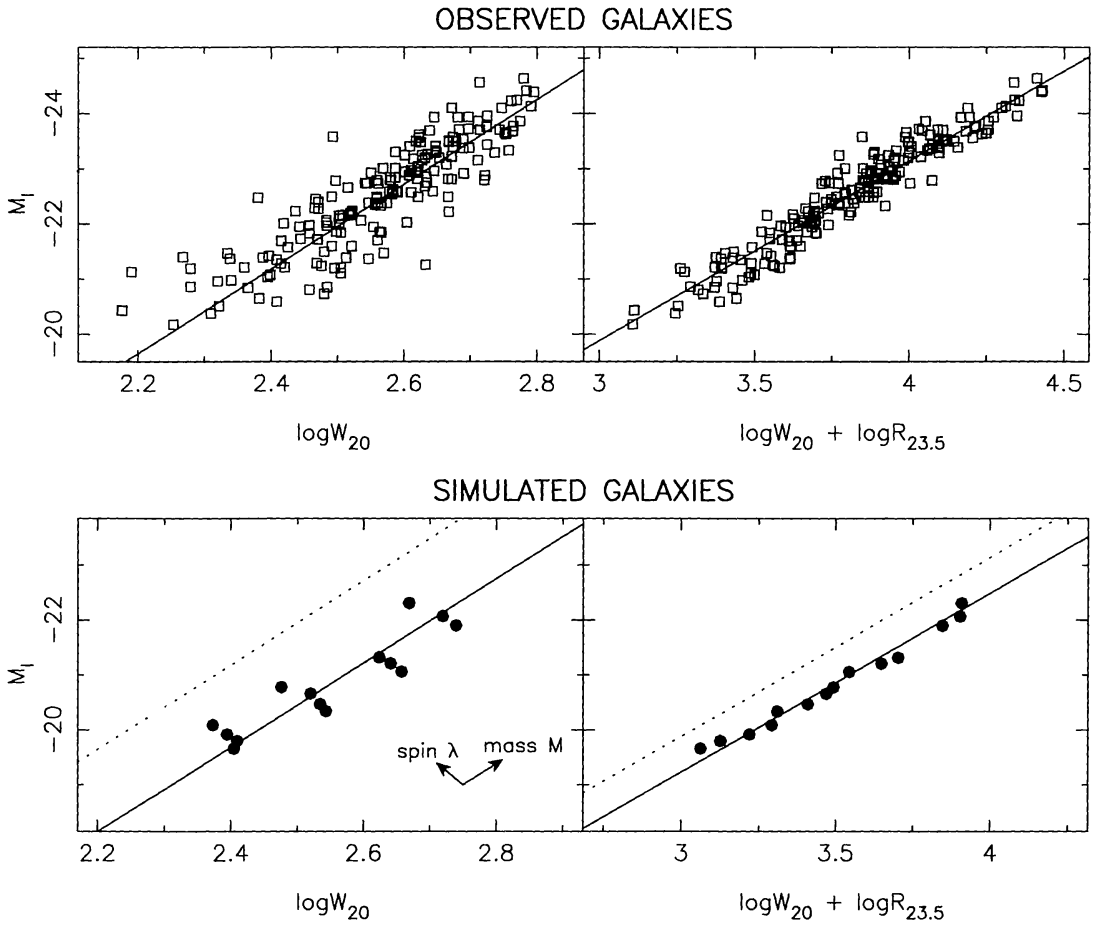

Figure 1. Comparison of observed (upper panels) and simulated (lower panels) galaxies in the Tully-Fisher projection (left panels) and edge-on projection (right panels) of the scaling plane. In the lower panels, the dotted lines present the observed correlation (as do the solid lines in the upper panels), and the zero-points of the solid lines are shifted by eye to fit them to the simulations. Note the ranges of axes are different between upper and lower panels, but the lengths of axes are exactly the same. We can compare the slope and scatter between the upper and lower panels. The simulations reproduce the slope of the observed scaling plane, but not the zero-point. The zero-point discrepancy would result mainly from the adopted cosmology ($h = 0.5$, $\Omega_0 = 1$). In the lower-left panel, the directions of mass and spin parameter are illustrated. The TF correlation lies along the mass sequence and the scatter along the spin parameter. This suggests that the scaling plane would originate from the difference of galactic mass and spin parameter, because the TF relation is an oblique projection of the scaling plane, and shows a whole view of the scaling plane.