

R21c Peculiar Velocities of the Galaxies beyond the Local Void. III.

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The Local void is the nearest void from us. Although the significant part of the void is behind the Milky way, extensive searches have revealed the reality of the underdense region and it is located toward almost +SGZ direction. The existence of the Local void could account for the peculiar motion of the Local group perpendicular to the Supergalactic plane, which amounts to ~ 300 km/s toward -SGZ and the source of the motion remains unclear. Moreover, the effect of the local void to the peculiar motion of the Local group could be a part of the evolution of the large-scale structure in the local universe; higher mass density regions are contracting and voids are expanding. If this is the case, the galaxies located at the far-side boundary of the Local Void would have an excess of receding motions in addition to the normal Hubble flow, caused by the mass concentration behind them. With this idea, we have studied the peculiar velocities of the galaxies at the far-side of the Local void, using the distance estimates based on the Tully-Fisher relation.

We selected about 50 edge-on spiral galaxies at $< 5,000$ km/s around the North Supergalactic pole. With our own H-band imaging observations at UH88 and IRSF as well as HI 21cm line widths observations at Nancay with additional data from literature, we found that the galaxies between 30 – 50 Mpc (the rim of the far-side structure) show an excess of receding motion, implying the expansion of the void. We further examined the significance of this excess by examining the effect of selection biases thorough the tests using mock catalogues.