A Simulation of ALFALFA

Expected sky distribution of sources with $M_\text{HI} \geq 10^8\ M_\odot$ can only be detected at very small distances, e.g. sources of HI mass $M_\text{HI} < 10^9\ M_\odot$ can only be detected if nearer than 60 Mpc.

A Simulation of VAVÀ, a VIRgo Anti-VIRgo HI Survey

The goal of this survey is to establish whether the HBIMF is environment-dependent. The region of highest cosmic density in the local Universe is the Virgo cluster. We thus propose to sample a region near R=40,000 kpc, for which - at a distance comparable to the Virgo cluster - we find a very inhomogeneous void. We thus propose to map a solid angle equal to that of the Virgo region in that direction. The combined survey we call VAVÀ.

Distributions of the expected $M_\text{HI}$ distribution with redshift. Note that low mass systems can only be detected at very small distances, e.g. sources of HI mass $M_\text{HI} < 10^9\ M_\odot$ can only be detected if nearer than 60 Mpc.

Why a shallower all-Virgo sky survey, rather than a deeper one over a smaller solid angle?

Because for equal survey time, a shallow, wide angle survey is more efficient in the sky results from the large distribution with redshift. Note for equal survey time, a shallow, wide angle survey is more efficient.