LARGE SCALE STREAMING IN THE WAKE OF A LOOP OF COSMIC STRING.

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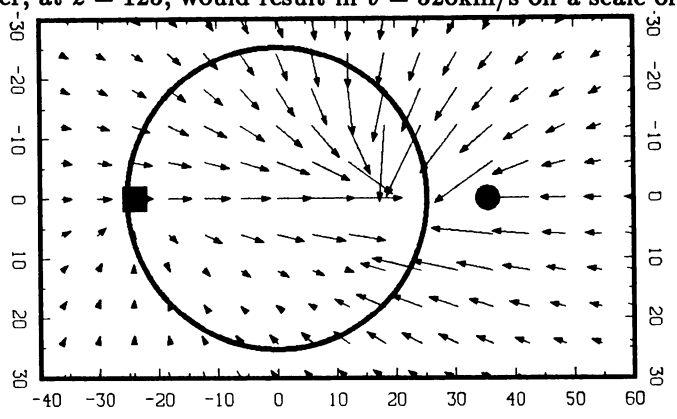
Large-scale streaming can be caused by a single "strange attractor" located at a distance $D \sim 45h^{-1}$Mpc from our galaxy (Faber, these proceedings). These observations can be interpreted in terms of a wake of a large loop of cosmic string laid down at $z \lesssim 1000$. The velocity field induced by a stationary loop modeled as a thin spherical shell has a radial dependence $v \sim r^{-1}$, consistent with the observed. Zeldovich spectrum of density perturbations would result in $v \sim r^{-3}$. The stationary loop model can account for the observed amplitude of the peculiar velocity ($v \simeq 500$km/s at $D \simeq 45h^{-1}$Mpc) only if the dimensionless string tension $G\mu/c^2$ is large, $\gtrsim 7 \times 10^{-6}$. When peculiar velocities of the loops are taken into account, the estimate of μ can be lowered: The loop is now able to spread its influence. The flow induced by the loop with the physical radius $R_S = 36h^{-1}$kpc moving initially with $v_S = 0.1c$ and laid down at z=500 is shown in the top portion of the diagram below. The distances are in h^{-1}Mpc's. The initial comoving loop size and location are indicated by a circle and the present-day location by a dot. Bottom part of the figure shows the line-of-sight peculiar velocities with respect to the microwave background seen by the observer located at the point marked with the square. The loop induces $v = 480$km/s at $\sim 35h^{-1}$Mpc from the nonlinear part of the diagram – presumed location of the "strange attractor" – providing that its mass is $M_S = 9 \times \mu R_S$, with $G\mu/c^2 = 5 \times 10^{-6}$. A loop with $R_S \simeq 300h^{-1}$kpc deposited later, at $z = 125$, would result in $v = 520$km/s on a scale of $45h^{-1}$Mpc.



J. Audouze et al. (eds.), Large Scale Structures of the Universe, 568.