ON THE INTERNAL STRUCTURE OF RELATIVISTIC JETS COLLIMATED BY AMBIENT GAS PRESSURE

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Recent progress in VLBI observations of relativistic jets outflowing from active galactic nuclei [1] gives us the direct information about jet width dependence $r_{jet}(l)$ on the distance l from the "central engine". Being the missing link in previous works, this relation opens the possibility to determine the internal structure of a jet. We have considered relativistic jet submerged into environing medium with finite gas pressure P_{ext}. Neither external magnetic field nor infinitely thin current sheet were assumed. This approach allows us to construct reasonable solution in which both magnetic field and flow velocity vanish at the jet boundary $r = r_{jet}$. The evident connection between external gas pressure and internal structure of relativistic jet is determined. Change of jet profile was also predicted as a consequence of transition from magnetically-dominated to partically-dominated flowing. The change must be because of asymptotical relation for gamma-factor in case of magnetically-dominated jet $\Gamma \propto r\Omega/c < \sigma$ cannot be satisfied for large transversal radius and leads to rebuilding of relativistic outflow character for quite small σ.

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REFERENCES

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