Evidence of Magnetic Acceleration & Collimation in AGN Jets



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SUMMARY of THIS TALK

- A constraint of magnetic acceleration & collimation (MAC) zone in the M87 jet; how does the flow become relativistic?
 → MAC zone may *not* be defined by only MHD jet theory (positions of recollimation shocks in self-similar solutions)
- Structural transitions of AGN jets scaled by M.; stationary features (recollimation shocks) may play a role

→ An intrinsic correlation w/ the M_{\bullet} - σ relation and a potential connection to VHE emission regions





























Summary

- Jets scaled by SMBH(M_{\bullet}): M_{\bullet} σ relation & AGN Unification
 - M87: "Rosetta stone" of AGN jets
 - Jet MAC nozzle powered by the TAW
 - Transition of streamlines beyond a stationary knot
 - VHE γ-ray emissions & ejections of superluminal knots

Paraboloidal structure: $z \propto r^a, 1 < a \leq 2$	Re-collimation & accumulating azimuthal B -field	Conical structure: $z \propto r \ (\gamma \theta \sim 1)$
$p_{\rm ism} \propto z^{-b}$	$\nabla p_{\rm ism} \sim 0$	
Magnetic Acceleration & Collimation (MAC) Zone		
TAW		
SMBH B_{ϕ}		Stationary knot
$10.0 \left(M_{ m BH}/10^8 M_{\odot} ight)^{0.5-0.6} ~{ m pc}$		
MN & Norman		













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 - \rightarrow An intrinsic correlation w/ the M_{\bullet} - σ relation and a potential connection to VHE emission regions
- Future insight of sub-mm VLBI (Greenland Telescope: GLT) project to explorer the SMBH & the origin of the M87 jet
 →BH(BZ77), disk (BP82), or hybrid(M99)? / spin paradigm?