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Plasmoid formation in jets and accretion disks BART RIPPERDA, ALEXANDER PHILIPPOV, Center for Computational Astrophysics, Flatiron Institute / Department of Astrophysical Sciences, Princeton University, LORENZO SIRONI, Department of Astronomy, Columbia University, FABIO BACCHINI, Institut fr Theoretische Physik, Frankfurt, OLIVER PORTH, Astronomical Institute Anton Pannekoek, University of Amsterdam, JORDY DAVELAAR, Department of Astrophysics/IMAPP, Radboud University Nijmegen — Black hole accretion disks and jets, consisting of charged particles, regularly emit high-energy radiation. Macroscopic plasma dynamics of such systems is described by general relativistic magnetohydrodynamics (GRMHD), coupling the charged particle fluid to electromagnetic fields. Despite outstanding results achieved with GRMHD, current studies are affected by a lack of information on microscopic physics. Nonthermal radiation is governed by the interaction between micro- and macroscopic physics and to interpret observations both scales need to be resolved. Magnetic energy can be transferred from the macroscale through turbulent magnetic reconnection and plasmoid formation, accelerating radiating particles on the microscale. In GRMHD models, reconnection is caused by finite resistivity allowing magnetic energy to dissipate and heat the plasma. We employ a novel resistive GRMHD code BHAC (Black Hole Accretion Code) to study reconnection and plasmoid formation in accretion disks and jets. Modeling nonthermal radiation is the main uncertainty in interpreting observations of the accretion disk and jet of M87 by the Event Horizon Telescope and flaring emission from Sgr A* by the GRAVITY collaboration.

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