

Mean-field dynamo and fast reconnection mechanisms in relativistic astrophysical plasmas

Luca Del Zanna^{1,†}

¹ *University of Florence, Italy*

[†] luca.delzanna@unifi.it

Extreme astrophysical sources, such as neutron stars and the environment around black holes, are characterized by strong magnetic fields that are crucial to explain their high-energy emission. Such magnetic fields may be subject to complex evolution inside the hosting relativistic plasmas, like dynamo processes amplifying initial seed fields in early stages, or dissipative reconnection events in thin current sheets as believed to occur in the magnetospheres of magnetars. We present a unified treatment of these non-ideal effects within the framework of general relativistic magnetohydrodynamics (GRMHD) and show selected results from numerical simulations obtained with our ECHO code.