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Critical current in disordered iron-pnictide superconducting wires[1] DUSHKO KUZMANOVSKI, MAXIM VAVILOV, University of Wisconsin - Madison, ANTON VORONTSOV, Montana State University — We evaluate the critical current in narrow wires of disordered iron-based pnictide superconductors. We present the Eilenberger and Usadel equations for a two-band model of a pnictide superconductor which take into account both inter and intra-band scattering events. The intra-band scattering events are responsible for the momentum relaxation of charged excitations, but do not suppress the homogeneous superconducting state. On the contrary, the inter-band scattering acts as the depairing mechanism. We apply the Usadel equation to analyze the dependence of the critical current on the strength of disorder in narrow iron-pnictide wires.

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