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MeV and TeV Emission from Millisecond Pulsar Binaries ALICE HARDING, NASA Goddard Space Flight Center, ZORAWAR WADIASINGH, NASA Goddard Space Flight Center/USRA/North-West University, CHRISTIAN VAN DER WERWE, CHRISTO VENTER, North-West University, MATTHEW BARING, Rice University — Black widow (BW) and redback (RB) systems are compact binaries in which a millisecond pulsar heats its low-mass companion by its intense wind of relativistic particles and emission. Radio and optical follow-up of unidentified Fermi Large Area Telescope (LAT) sources has expanded the number of these systems from four to nearly 30. Orbital modulation in X-rays observed in many systems suggests an intrabinary shock exists as a site for particle acceleration, which in many instances wraps around the pulsar. We model the broadband spectral components from nearby 'spider binaries', including diffusion, convection and radiative energy losses of shock-accelerated particles in an axially-symmetric, steady-state approach. The resulting spectra comprise two main components: synchrotron radiation from X-rays to soft gamma rays and inverse-Compton emission at TeV energies from scattering thermal photons from the companion star. Two sources, J1723-2837 (RB) and J1311-3430 (BW), have been observed by Fermi-LAT, leading to constraints on the maximum particle energy and particle acceleration in these mini pulsar wind nebulae. We find that nearby binaries in a 'flaring state' are promising targets for H.E.S.S. and the future Cherenkov Telescope Array and that GeV photons may be detectable by Fermi-LAT. Moreover, some of these systems will be excellent targets for future MeV missions such as AMEGO.

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