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Sooyeon Lee* (slee27@olemiss.edu) and **Haidong Wu**. *Beta invariants of 3-connected matroids.*

Beta invariants have been studied by Crapo, Brylawski, Oxley and others. Crapo showed that a matroid with at least two elements is connected if and only if its beta invariant is greater than zero. Brylawski showed that a connected matroid has beta invariant one if and only if M is isomorphic to a serial-parallel network. Oxley characterized all matroids with beta invariants 2, 3 and 4. In this paper, we first give a best possible lower bound on the beta invariants of 3-connected matroids, then we characterize all 3-connected matroids attaining the lower bound. We also completely characterize all binary matroids with beta invariants 5, 6, and 7. Lastly, we provide alternate proofs for the known results in polynomial invariants of graphs using the beta invariant. (Received September 11, 2017)