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Suil O* (suilo2@math.uiuc.edu), 409 W. Green Street, Urbana, IL 61801, and **Sebastian Cioaba** and **Douglas B West**. *Edge-connectivity, eigenvalues, and matchings in regular graphs.*

We prove a lower bound for the minimum size of a maximum matching in an l -edge-connected k -regular graph with n vertices, for $l \geq 2$ and $k \geq 4$. Again it is sharp for infinitely many n , and we characterize when equality holds in the bound. We also study the relationship between eigenvalues and the existence of certain subgraphs in regular graphs. We give a condition on an appropriate eigenvalue that guarantees a lower bound for the matching number of a t -edge-connected d -regular graph, when $t \leq d - 2$. This work extends some classical results of von Baebler and Berge and more recent work of Cioaba, Gregory, and Haemers. (Received September 12, 2010)