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**Jessica McDonald** and **Gregory J. Puleo\*** (gjp0007@auburn.edu). *t*-Cores for  $(\Delta + t)$ -edge-colouring.

We extend the edge-coloring notion of *core* (subgraph induced by the vertices of maximum degree) to *t-core* (subgraph induced by the vertices  $v$  with  $d(v) + \mu(v) > \Delta + t$ ), and find a sufficient condition for  $(\Delta + t)$ -edge-coloring. In particular, we show that for any  $t \geq 0$ , if the *t-core* of  $G$  has multiplicity at most  $t + 1$ , with its edges of multiplicity  $t + 1$  inducing a multiforest, then  $\chi'(G) \leq \Delta + t$ . This extends previous work of Ore, Fournier, and Berge and Fournier. More generally, we prove bounds on the *fan number* of a graph  $G$ , a parameter introduced by Scheide and Stiebitz as an upper bound on the edge chromatic number. We give an exact characterization of the multigraphs  $H$  such that  $\text{Fan}(G) \leq \Delta(G) + t$  for all graphs  $G$  having  $H$  as their *t-core*. We show how this characterization implies a theorem of Hoffman and Rodger about cores of  $\Delta$ -edge-colourable simple graphs. (Received September 26, 2017)