1077-05-611 **Xing Peng*** (pengx@mailbox.sc.edu), 1523 Greene St, Columbia, SC 29208, and **Linyuan Lu** (lu@math.sc.edu), 1523 Greene St, Columbia, SC 29208. *A fractional analogue of Brook's theorem.*

Let $\Delta(G)$ be the maximum degree of a graph G. Brooks' theorem states that the only connected graphs with chromatic number $\chi(G) = \Delta(G) + 1$ are complete graphs and odd cycles. We prove a fractional analogue of Brooks' theorem in this paper. Namely, we classify all connected graphs G such that the fractional chromatic number $\chi_f(G)$ is at least $\Delta(G)$. These graphs are complete graphs, odd cycles, C_8^2, $C_5 \boxtimes K_2$, and graphs whose clique number $\omega(G)$ equals the maximum degree $\Delta(G)$. Among the two sporadic graphs, the graph C_8^2 is the square graph of cycle C_8 while the other graph $C_5 \boxtimes K_2$ is the strong product of C_5 and K_2. (Received September 08, 2011)