1080-05-351 **Stephen G. Hartke*** (hartke@math.unl.edu), University of Nebraska–Lincoln, **Hong Liu**, University of Illinois at Urbana-Champaign, and **Sarka Petrickova**, University of West Bohemia. *On colorings of fractional powers of graphs.* Preliminary report.

For any $n \geq 0$, the n-subdivision of a graph G is the graph $G^{1/n}$ formed from G by replacing each edge with a path of length n. For any $m \geq 0$, the mth power of G is the simple graph G^m with the same vertex set as G and where two vertices are adjacent in G^m if the distance between them in G is at most m. For $m < n$, the fractional power $G^{m/n}$ of G is the mth power of $G^{1/n}$. Motivated by the Total Coloring Conjecture of Vizing and Behzad, Iradmusa proposed the question of determining the chromatic numbers of fractional powers in terms of their clique numbers. He conjectured that $\chi(G^{m/n}) = \omega(G^{m/n})$ when G is a connected graph with $\Delta(G) \geq 3$ and $m < n$. We prove the conjecture in many cases, such as when $\Delta(G) \geq 4$ and m is even. We also give a counterexample to the conjecture with maximum degree 3. (Received January 31, 2012)