1146-05-392   **Mark Ellingham*** (`mark.ellingham@vanderbilt.edu`), **Pouria Salehi Nowbandegani** and **Songling Shan**. *Toughness and prism-hamiltonicity of P_4-free graphs.*

The *prism* over a graph G is the product $G \square K_2$, i.e., the graph obtained by taking two copies of G and adding a perfect matching joining the two copies of each vertex by an edge. The graph G is called *prism-hamiltonian* if it has a hamiltonian prism. Jung showed that every 1-tough P_4-free graph with at least three vertices is hamiltonian. We extend this to observe that for $k \geq 1$ a P_4-free graph has a spanning *k-walk* (closed walk using each vertex at most k times) if and only if it is $(1/k)$-tough. As our main result, we show that for the class of P_4-free graphs, the three properties of being prism-hamiltonian, having a spanning 2-walk, and being $(1/2)$-tough are all equivalent. (Received January 27, 2019)