1086-47-1894 **Antonia E. Cardwell*** (antonia.cardwell@millersville.edu), Department of Mathematics, Millersville University, P. O. Box 1002, Lancaster, PA 17551. *A weakly dense sequence that is not norm dense.*

A bounded linear operator $T : X \to X$ is said to be (norm) hypercyclic if there is a vector $x \in X$ such that the orbit $\mathrm{Orb}(T, x) = \{x, Tx, T^2x, \ldots\}$ is norm-dense in X. An operator $T : X \to X$ is said to be weakly hypercyclic if there is a vector $x \in X$ such that the orbit is dense in X with respect to the weak topology. As the norm topology is stronger than the weak topology, every norm hypercyclic operator is weakly hypercyclic. In 2002, N. S. Feldman posed the question of whether every weakly hypercyclic operator is also (norm) hypercyclic. In 2004, K. Chan and R. Sanders gave a sufficient condition for a bilateral weighted shift on $\ell_p(\mathbf{Z})$ $(2 \leq p < \infty)$ to be weakly hypercyclic (but not norm hypercyclic), giving a negative answer to Feldman's question. The question then arises of which spaces support such operators. The question can be rephrased to ask in which spaces there exists a sequence that is weakly dense but not norm dense. We construct such a sequence, first for the spaces $\ell_p(\mathbf{N})$ $(1 < p < \infty)$, and then for certain spaces with a shrinking, monotone basis whose dual space has an unconditional basis. (Received September 24, 2012)