1070-03-179 **Paola D'Aquino**, **Julia Knight** and **Karen Lange***, Mathematics Department, 255 Hurley, Notre Dame, IN 46556. *Computability of integer parts.*

An *integer part* of a real closed field R is a discrete ordered subring I containing 1 such that for all $r \in R$ there exists a unique $i \in I$ with $i \leq r < i + 1$. Mourgues and Ressayre showed that every real closed field R has an integer part. For a countable real closed field R, we previously showed that the integer part obtained by the procedure of Mourgues and Ressayre is $\Delta^0_{\omega^\omega}(R)$. We would like to know whether there exists a construction that yields a computationally simpler integer part, perhaps one that is $\Delta^0_2(R)$. All integer parts are *Z-rings*, discretely ordered rings that have the euclidean algorithm for dividing by integers. By a result of Wilkie, any Z-ring can be extended to an integer part for *some* real closed field. We show that we can compute a maximal Z-ring I for any real closed field R that is $\Delta^0_2(R)$, and we then examine whether this I must serve as an integer part for R. We also show that certain subclasses of $\Delta^0_2(R)$ are not sufficient to contain integer parts for a real closed field R. (Received February 10, 2011)