1067-03-679 **Karen M. Lange*** (klange1@nd.edu), Mathematics Department, 255 Hurley Hall, Notre Dame, IN 46556, and **Julia F. Knight** (knight.1@nd.edu), Mathematics Department, 255 Hurley Hall, Notre Dame, IN 46556. *Generalized power series and exponential real closed fields.* Preliminary report.

An *integer part* I for an ordered field R is a discrete ordered subring 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. Let k be the residue field of R, and let G be the value group of R. Let $k\langle\langle G\rangle\rangle$ be the set of *generalized power series* of the form $\Sigma_{g \in S} a_g g$ where $a_g \in k$ and the support of the power series $S \subseteq G$ is well ordered. Mourgues and Ressayre produce an integer part for R by building a special embedding of R into $k\langle\langle G\rangle\rangle$. To understand the complexity of integer parts, we analyzed an algorithmic version of their construction for countable R and showed that the generalized power series in the image of R are of length less than ω^{ω^ω}. Ressayre showed that every real closed exponential field has an integer part that is closed under 2^x using the same approach. However, he had to more carefully choose the value group G and the embedding of R into $k\langle\langle G\rangle\rangle$. We explore how these alterations affect the lengths of the generalized power series in the image of R. (Received September 13, 2010)