1067-03-1880 **Koushik Pal*** (koushik@math.berkeley.edu). *Model theory of multiplicative valued difference fields.*

A *valued difference field* (K, σ, v) is a valued field (K, v) with a field automorphism $\sigma : K \to K$, satisfying $\sigma(\mathfrak{O}_K) = \mathfrak{O}_K$, where $\mathfrak{O}_K$ is the ring of integers. The theory of such a structure depends on how the automorphism interacts with the valuation function. If (K, σ, v) satisfies $v(\sigma(x)) = v(x)$ for all $x \in K$, the valued difference field is called *isometric*. The model theory of such structures has been studied by Luc Bélair, Angus Macintyre and Thomas Scanlon. If (K, σ, v) satisfies $v(\sigma(x)) > nv(x)$ for all $n \in \mathbb{N}$ and for all $x \in K^\times$ such that $v(x) > 0$, the valued difference field is called *contractive*. The model theory of such structures has been studied by Salih Azgin. I am going to talk about a more general case, which incorporates the above two cases, and which we call *multiplicative*. A multiplicative valued difference field satisfies $v(\sigma(x)) = qv(x)$, where q (> 0) is interpreted as an element of a real-closed field. For example, q could be 2, i.e., $v(\sigma(x)) = 2v(x)$. I will give axiomatization for such theory, prove an Ax-Kochen-Ershov kind of result and show that the theory admits relative quantifier elimination. (Received September 22, 2010)