1121-49-232 **Andrew Lorent*** (alorent@gmail.com), University of Cincinnati, 2815 Commons Way, 4199 French Hall West, Cincinnati, OH 45220. *An absolute three well Liouville theorem.*

We will discuss the rigidity results for differential inclusions into sets of matrices of the form $SO(n)A_1 \cup SO(n)A_2 ... SO(n)A_n$. For the case when $n = 1$ an optimal quantitative Liouville theorem was established by Friesecke-Muller-James. This by now classic result has had an enormous impact on Calculus of Variations. For $n = 2$ under the (necessary) assumption that the total oscillation of the gradient was bounded by a small fixed constant (depending on A_1, A_2) an optimal quantitative two well Liouville theorem was established by Jerrard and Lorent in 2008, followings partial results by Lorent 2005, Conti-Schweizer 2006, Chermisi-Conti 2008. Simple examples show there is no Liouville theorem of any kind when $n = 4$, which leaves open the question of $n = 3$. All methods for $n = 2$ fail for general matrices when $n = 3$. We will sketch the history of this subject and will present an absolute three well Liouville theorem for $n = 3$ where A_1, A_2, A_3 are diagonal matrices. (Received July 18, 2016)