1080-92-66 **Alan Veliz-Cuba**, **Kristina Buschur**, **Rose Hamershock**, **Ariel Kniss**, **Esther Wolff** and **Reinhard Laubenbacher*** (reinhard@vbi.vt.edu), Washington St. (0477), Blacksburg, VA 24061. *Steady state analysis of Boolean network models via a universal class of models.* Preliminary report.

Boolean networks have been used in modeling biological systems to focus attention on the qualitative features of the system, such as the wiring diagram. However, for any wiring diagram, there are multiple Boolean networks associated with it. One way to overcome this issue is to restrict the family of Boolean networks to obtain a one to one correspondence between wiring diagrams and Boolean networks. One such family is the family of AND-NOT networks. In this talk we show that this family is in fact capable of generating all Boolean networks. More precisely, we formally show that any Boolean network can be transformed to an AND-NOT network with similar dynamics. Our results make tools for AND-NOT networks accessible to all Boolean networks and also show that the family of AND-NOT networks is general enough for modeling. Furthermore, previous results combined with those we present here prove that any finite dynamical system can be decomposed into an AND-NOT network. We illustrate our results by applying them to a Boolean model of Th-cell differentiation. (Received January 04, 2012)