

1077-00-1953

Wei Zhang* (zhangwei19890308@gmail.com), 2207 Avenue J, 208, SELECT, Huntsville, TX 77340, and **Jianzhong Wang**. *On Scaling Infinite Products and their Application in Operator Decomposition*.

This thesis investigates scaling infinite products, which is a special kind of infinite products widely used in many areas and their applications in decomposition of differential operators, particularly the operators that occurs in harmonic analysis.

The thesis is outlined as follows. In Section 1, a brief historical review of infinite product is given. the notions and notations that are often used in this thesis are also introduced. In Section 2, the scaling infinite products are introduced and their properties and truncated errors are studied. Several important examples of this kind infinite products are studied in details. In Section 3, the infinite products of functions are expanded to matrices and operators. First, the product decomposition of inverses of matrices is investigated, then infinite product forms of Laplacian and resolvent operator are presented. (Received September 22, 2011)