

**The Classification of CHF Data Using Principal Component
Analysis (PCA) and Hierarchical Clustering Method**

B.S. Jun, E.J. Park, S.G. Yang, H.J. Kim, K.H. Kim, J.R. Park
Korea Nuclear Fuel Co., Ltd.
P.O. Box 14, Yusong, Taejon, Korea, 305-600,

ABSTRACT

A new approach for classification of critical heat flux (CHF) data based on the principal component analysis (PCA) and the hierarchical clustering method is suggested. The PCA is used to describe the multivariate structure of CHF data and the characteristics of resulting CHF structures are identified. The agglomerative hierarchical clustering is performed to see the proximity of the CHF data with the obtained information. Clusters are represented by a dendrogram and grouped into three meaningful categories. Katto's CHF-regime map is applied to the resulted CHF group for a better understanding of the physical meaning of the clusters. The combination between principal component analysis and agglomerative hierarchical clustering method provides a meaningful grouping of CHF data which can be used for other applications.