

A MODEL CONCERNING THE CHAOS THEORY FOR OPTIMIZING THE FUEL MIXTURE FOR THE FEEDING OF A GAS TURBINE

C. Allouis*, **A. Amoresano****, **G. Langella****, **V. Niola****, **G. Quaremba****
allouis@irc.cnr.it

*Istituto di Ricerche sulla Combustione – CNR, P.le V.Tecchio 80, 80125 Napoli - Italy

**Dipartimento di Ingegneria Industriale – Università “Federico II” di Napoli, Via Claudio,
21 80125 Napoli – Italy

Abstract

A novel mathematical model is presented for the optimization of micro gas turbine fueled with different fuels. A complete study of vibrations of a 100 kW micro gas turbine was performed changing the fuel composition. The objective was to develop a model able to give fuel changing indication looking at the frequency analysis of the complete machine based on a new model based on chaos and wavelet theory. The frequency analysis combined with this mathematical model allowed to fingerprint the behavior of the micro gas turbine fueled with the different fuels.