

**BASIN EXPLOSIONS AND ESCAPE PHENOMENA IN THE TWIN-WELL DUFFING
OSCILLATOR: COMPOUND GLOBAL BIFURCATIONS ORGANIZING BEHAVIOUR**

by

Y. Ueda

Dept of Electrical Engineering, Kyoto University, Kyoto, Japan

S. Yoshida

Dept of Electrical Engineering, Kyoto University, Kyoto, Japan

H.B. Stewart

Applied Maths Division, Brookhaven National Laboratory, Upton, NY 11973, USA

J.M.T. Thompson, F.R.S.

Dept of Civil Engng, University College London, Gower Str, London, WC1E 6BT, UK

(Received 25 October 1989)

The sinusoidally driven, twin-well Duffing oscillator has become a central archetypal model for studies of chaos and fractal basin boundaries in the nonlinear dynamics of dissipative ordinary differential equations. It can also be used to illustrate and elucidate universal features of the escape from a potential well, the jumps from one-well to cross-well motions displaying similar characteristics to those recently charted for the cubic one-well potential. We identify here some new codimension-two global bifurcations which serve to organize the bifurcation set and structure the related basin explosions and escape phenomena.

To appear in the first Theme Issue of
Phil. Trans. R. Soc. Lond., Series A, 1990

In press, January 1990