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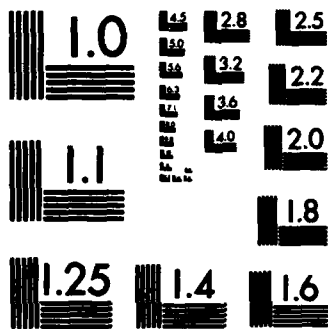UNCLASSIFIED   ARO-15486.17-MA DAAG29-79-C-0183   F/G 21/2   NL

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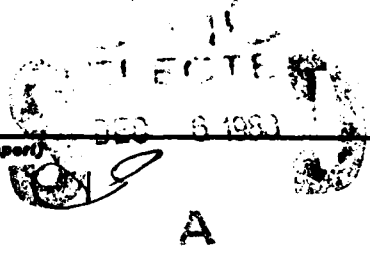
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

We have carried out a research program in Bifurcation and Stability Theory with applications to Combustion and Flame Propagation, in which we determined both qualitative and quantitative behavior of solutions of these problems. In particular we obtained results on the transition from laminar to turbulent combustion. In our study we derived various simplified models from the general equations governing combustion, which were more amenable to mathematical analysis. The methods of bifurcation and stability were then employed on the resulting models.

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Bifurcation and Stability Theory with Application to Problems of

Combustion and Flame Propagation

FINAL REPORT

Bernard J. Matkowsky

October 30, 1983

U.S. Army Research Office

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~~We have carried out~~ a research program in Bifurcation and Stability Theory with applications to Combustion and Flame Propagation, ~~in~~ which we determined both qualitative and quantitative behavior of solutions of these problems. ~~In particular we obtained~~ Results (*were obtained*) on the transition from laminar to turbulent combustion. ~~In our study we derived~~ Various simplified models (*were derived*) from the general equations governing combustion, which were more amenable to mathematical analysis. The methods of bifurcation and stability theory were then employed on the resulting models. A list of all the papers published, is appended. In addition a list of scientific personnel participating in the research program is appended. ←

LIST OF SCIENTIFIC PERSONNEL

Principal Investigator - Prof. B. J. Matkowsky

Associate Investigators -- Prof. T. Erneux
                           Prof. A. van Harten
                           Prof. A. K. Kapila
                           Prof. M. Matalon
                           Prof. G. I. Sivashinsky

Student -- D. O. Olagunju -- received Ph.D.
        Thesis title -- "Bifurcation and Stability of Propagating
                         Oscillatory Flames"

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