Abstract Submitted
for the DFD13 Meeting of
The American Physical Society

Turbulent combustion modeling using explicit convolution of 1-D laminar flame S. MUKHOPADHYAY, R.J.M. BASTIAANS, J.A. VAN OIJEN, L.P.H. DE GOEY, Technische Universiteit Eindhoven — Increasing computational power is enabling highly resolved Large Eddy Simulation (LES) of turbulent reacting flows. However resolving chemical scales in a practical combustor even with tabulated chemistry methods, still remains unaffordable and requires a model. DNS of a premixed slot flame is performed and *a priori* analysis indicates that laminar flame filtered at suitable scale can represent the chemical state in a turbulent reacting flow. But to represent all the chemical states, multiple filter widths will be required. This work explores a new modeling approach, Filtered Flamelet Generated Manifold (FFGM) based on explicit convolution of 1-D laminar flame solutions with spatial filter kernel of varying widths. To test the validity of the model *a posteriori* analysis, using tabulated chemistry constructed by convoluting a premixed laminar flame with top hat kernel of multiple widths is performed for the DNS configuration. The results indicate good performance of the model compared to DNS at a fraction of computational cost.

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Date submitted: 01 Aug 2013 Electronic form version 1.4