Abstract. *A pseudo-compressibility method for turbulent reactive flows with heat release is adapted to an unstructured finite volume hybrid grid scheme. Premixed reactants are considered and a flamelet approach for combustion modeling is adopted, using a continuous quenched mean reaction rate. The spatial discretization is an overlapped cell vertex approach. Additional artificial dissipation is added to stabilize the final discretized governing equations. To integrate the final form of discretized governing equations, a three-stage hybrid time-stepping scheme is used. An infinite planar flame propagating freely is considered as test case, and the calculated solution using the proposed method coincides with the results available in the literature.*

Keywords. *turbulent combustion, quenched flame, finite volume method, unstructrured hybrid grid, pseudo-compressibility method.*

CIT02-0725 - INNER STRUCTURE OF BICOMPONENT FUEL DIFFUSION FLAMES: EXTINCTION CONDITION.

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Abstract. *The analysis addresses the extinction problem of diffusion flames in which two fuels are consumed simultaneously. A single step finite rate reaction is considered for each fuel. The extinction problem is described by the large activation energy asymptotics, assuming that the ratio of the activation energies for the two reactions is order unity. Thus, the two chemical reactions take place inside the same zone in the flow field. The present model is characterized by two new parameters. The first parameter, D, is the ratio of the Damkh¨oler numbers of the second and first reactions. It measures the reactivity of the second reaction in terms of the first reaction reactivity. The second parameter, AE, is the ratio of the activation energy of the second reaction to the activation energy of the first reaction. It specifies the thermal sensitivity of the second reaction in terms of the thermal sensitivity of the first reaction. For equal reactivities (D = 1) and equal thermal sensitivities (AE = 1) the classical results (Liñán, 1974) are recovered. The results obtained show a flammability limit for bicomponent fuel diffusion flames.*

Keywords. *large activation energy asymptotics, extinction, diffusion flame, internal flame structure, bicomponent fuel.*

CIT02-0731 - MEASUREMENT OF THE STABILITY LIMITS FOR THE PREMIXED METHANE/AIR COMBUSTION WITHIN CERAMIC FOAMS.

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Abstract. *The stability limits for the premixed methane/air combustion within porous ceramic were measured for an arrangement of four ceramic foam disks made of zirconia and silicon carbide. The arrangement consists of two ceramic disks of 40 ppi followed by two disks of 10 ppi, each disk with 20 mm thickness. For the zirconia burners the lean flammability limit was found in the equivalent ratio of 0,40. For each equivalent ratio there was a range of velocities in witch the flame stabilization was possible. The silicon carbide burners were degraded at the maximum temperature used. The results show the potential for the use of the available zirconia porous ceramics in the design of low cost radiant porous burners for use with temperatures below 1550 C.*

Keywords. *Combustion, Porous Media, Excess Enthalpy.*

CIT02-0797 - SIMULATION OF IRON COMBUSTION AT HIGH TEMPERATURE THROUGH A LIQUID OXIGEN JET.

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