











The results obtained show that predictions of flame zones based on the turbulence model (RSM) are generally slightly more credible than those obtained by the  $k-\epsilon$  model, in particular those concerning the dynamic field of velocity and energy. Turbulent as well as its constraints. scalar fields for the majority species. In general, factors such as (diffusion effect, radiation, buoyancy, etc.) are neglected, turbulent kinetic energy measurements, the mixing fraction, the majority species and the temperature in the flame zones considered are reasonably consistent with the results. experimental with a better prediction advantage for the RSM Model of turbulence.

## REFERENCES

- [1] Yilmaz, H., Cam, O., Tangoz, S., Yilmaz, I. (2017). Effect of different turbulence models on combustion and emission characteristics of hydrogen/air flames. *International Journal of Hydrogen Energy*, 42(40): 25744-25755. <https://doi.org/10.1016/j.ijhydene.2017.04.080>
- [2] Miltner, M., Jordan, C., Harasek, M. (2015). CFD simulation of straight and slightly swirling turbulent free jets using different RANS-turbulence models. *Applied Thermal Engineering*, 89: 1117-1126. <https://doi.org/10.1016/j.applthermaleng.2015.05.048>
- [3] Branley, N., Jones, W.P. (2001). Large eddy simulation of a turbulent non-premixed flame. *Combustion and Flame*, 127(1-2): 1914-1934. [https://doi.org/10.1016/S0010-2180\(01\)00298-X](https://doi.org/10.1016/S0010-2180(01)00298-X)
- [4] Roy, R.N., Sreedhara, S. (2016). Modelling of methanol and H<sub>2</sub>/CO bluff-body flames using RANS based turbulence models with conditional moment closure model. *Applied Thermal Engineering*, 93: 561-570. <https://doi.org/10.1016/j.applthermaleng.2015.09.073>
- [5] Kummitha, O.R. (2017). Numerical analysis of hydrogen fuel scramjet combustor with turbulence development inserts and with different turbulence models. *International Journal of Hydrogen Energy*, 42(9): 6360-6368. <https://doi.org/10.1016/j.ijhydene.2016.10.137>
- [6] Dutta, T., Sinhamahapatra, K. P., Bandyopdhyay, S.S. (2010). Comparison of different turbulence models in predicting the temperature separation in a Ranque–Hilsch vortex tube. *International Journal of Refrigeration*, 33(4): 783-792. <https://doi.org/10.1016/j.ijrefrig.2009.12.014>
- [7] Sardasht, M.T., Hosseini, R., Amani, E. (2017). An analysis of turbulence models for prediction of forced convection of air stream impingement on rotating disks at different angles. *International Journal of Thermal Sciences*, 118: 139-151. <https://doi.org/10.1016/j.ijthermalsci.2017.04.021>
- [8] Liu, Y., Yan, H., Liu, Y., Lu, L., Li, Q. (2016). Numerical study of corner separation in a linear compressor cascade using various turbulence models. *Chinese Journal of Aeronautics*, 29(3): 639-652. <https://doi.org/10.1016/j.cja.2016.04.013>
- [9] Farokhi, M., Birouk, M., Tabet, F. (2017). A computational study of a small-scale biomass burner: The influence of chemistry, turbulence and combustion sub-models. *Energy Conversion and Management*, 143: 203-217. <https://doi.org/10.1016/j.enconman.2017.03.086>
- [10] Cui, L. (2018). Refractive-index fluctuations spectrum considering the general distribution of turbulence cells in moderate-to-strong anisotropic turbulence. *Optik*, 154: 473-484. [doi.org/10.1016/j.ijleo.2017.10.082](https://doi.org/10.1016/j.ijleo.2017.10.082)
- [11] Roekaerts, D., Merci, B., Naud, B. (2006). Comparison of transported scalar PDF and velocity-scalar PDF approaches to ‘Delft flame III’. *Comptes Rendus Mecanique*, 334(8-9): 507-516. <https://doi.org/10.1016/j.crme.2006.07.007>
- [12] Khan, Z., Bhusare, V.H., Joshi, J. B. (2017). Comparison of turbulence models for bubble column reactors. *Chemical Engineering Science*, 164: 34-52. <https://doi.org/10.1016/j.ces.2017.01.023>
- [13] Larbi, A.A., Bounif, A., Senouci, M., Gökalp, I., Bouzit, M. (2018). RANS modelling of a lifted hydrogen flame using eulerian/lagrangian approaches with transported PDF method. *Energy*, 164: 1242-1256. <https://doi.org/10.1016/j.energy.2018.08.073>
- [14] Popoola, O., Cao, Y. (2016). The influence of turbulence models on the accuracy of CFD analysis of a reciprocating mechanism driven heat loop. *Case Studies in Thermal Engineering*, 8: 277-290. <https://doi.org/10.1016/j.csite.2016.08.009>
- [15] Larbi, A.A., Bounif, A., Bouzit, M. (2018). Comparisons of LPDF and MEPDF for lifted H<sub>2</sub>/N<sub>2</sub> jet flame in a vitiated coflow. *International Journal of Heat and Technology*, 36(1): 133-140. <https://doi.org/10.18280/ijht.360118>
- [16] Pond, I., Ebadi, A., Dubief, Y., White, C.M. (2017). An integral validation technique of RANS turbulence models. *Computers & Fluids*, 149: 150-159. <https://doi.org/10.1016/j.compfluid.2017.02.016>
- [17] Larbi, A.A., Bounif, A., Bouzit, M. (2018). Modeling and numerical study of H<sub>2</sub>/N<sub>2</sub> jet flame in vitiated co-flow using Eulerian PDF transport approach. *Mechanics & Industry*, 19(5): 504. <https://doi.org/10.1051/meca/2018029>
- [18] Prucker, S., Meier, W., Stricker, W. (1994). A flat flame burner as calibration source for combustion research: Temperatures and species concentrations of premixed H<sub>2</sub>/air flames. *Review of Scientific Instruments*, 65(9): 2908-2911. <https://doi.org/10.1063/1.1144637>