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Experimental investigation of self-turbulent flames CHRISTOPHE ALMARCHA, Aix-Marseille University, JOEL QUINARD, CNRS — When propagating downwards, premixed flames undergo hydrodynamic instabilities. The resulting dynamics exhibits multiple corrugations of the light emitting reaction zone. By changing the reactive mixture composition or the shape of the propagation volume, the characteristic lengths of perturbation are changed. We present here the experimental study of propane-air and methane-air flames propagating in vertical circular tubes and in vertically oriented Hele-Shaw cells. This last configuration allows comparison with two dimensional numerical models. The thermo acoustic instability, usually acting when flames propagate in confined volume, is damped thanks to an acoustic absorber, allowing the study of wide flames at the meter scale.

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