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Recent developments in miniaturization of thermoacoustic devices

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This talk will present a review of recent works on thermoacoustic devices miniaturization conducted at Laboratoire d'Acoustique de l'Université du Maine (LAUM), in collaboration with Laboratoire de Mécanique de Fluides et d'Acoustique (LMFA). A part of these works deals with new designs allowing higher compactness of devices. As an example, a compact non-resonant thermoacoustic refrigerator will be described, and experimental results obtained on a prototype will be presented. Another part of these works deals with the miniaturization of each element of a thermoacoustic device, especially the stack and the acoustic source. The acoustical and thermal sensors used to control these small devices have also to be miniaturized. Some specific actuators and sensors designed for miniaturized thermoacoustic refrigerators will be presented. Finally, potential applications of these miniaturized devices will be discussed.