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**Precise localisation of noise source using statistically optimal  
beamforming and post -processing deconvolution**

Jean-Claude Pascal<sup>a</sup>, Jing-Fang Li<sup>b</sup>, Xavier Carniel<sup>c</sup>, Axel Hass<sup>d</sup> and Laurent Bollade<sup>e</sup>

<sup>a</sup>ENSIM - LAUM, Université du Maine, rue Aristote, 72085 Le Mans, France

<sup>b</sup>Visual VibroAcoustics, 51 rue d'Alger, 72000 Le Mans, France

<sup>c</sup>Centre Technique des Industries Mécaniques (CETIM), 52, avenue Félix Louat, 60304 Senlis, France

<sup>d</sup>52, avenue Félix Louat, 60304 Senlis, France

<sup>e</sup>DYVA - DYnamique Vibration & Acoustique, 10 Rue Maryse Bastié, 69008 Lyon, France

Conventional data-independent beamforming with microphone array is widely used to locate sound sources and build acoustic model of equipments, engines and vehicles. The particularities of this technique are the use of a relatively few number of microphones and a simple signal processing. So, this technique is fast and easy to use. Other approaches using experimental data for computing the steering vector have been proposed to increase the resolution, for example, minimum variance method, and high-resolution methods. However these methods are often delicate to put in use in acoustic engineering where they are often reproached for lack of robustness in perturbed acoustic fields. Whereas, the most used methods nowadays are those by which the determination of the steering vector is data-independent. Among those methods we consider a method using a Statistically Optimal Array Processing (SOAP) completed by techniques of post-processing deconvolution, by which the resolution of the conventional beamforming is considerably increased, particularly at low frequencies. Some relevant indicators evaluate the performance of the proposed method by using perturbed data and by comparing between conventional and high-resolution beamformers. Examples of industrial measurements in a multi-sources environment demonstrate the practical interest of this technique.