**Speech enhancement in quasi-periodic noises using improved spectral subtraction based on adaptive sampling**

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**Abstract.** The paper presents a speech processing method based on spectral subtraction that is effective for reduction of specific rate-dependent noises. Such noises are produced by a variety of different rotation sources such as turbines and car engines. Applicability of convenient spectral subtraction for such noises is limited since their power spectral density (PSD) is connected with rotation rate and therefore constantly changing. The paper shows that in some cases it is possible to compensate variation of PSD by adaptive sampling rate. The signal can be processed in warped time domain that makes noise parameters more stable and easy to estimate. Stabilization of PSD leads to more accurate evaluation of noise parameters and significantly improves result of noise reduction. For de-termination of current rotation rate the proposed method can either use external reference signal or the noisy signal itself applying pitch detector to it. Considering that the noise typically consists of deterministic and stochastic components narrow-band and wide-band components of the noise are removed separately. The method is compared to the recently proposed maximum a posteriori method (MAP).

**Keywords:** Noise reduction Spectral subtraction Time warping.

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