ABSTRACT: Despite a continuous development in computer sciences and related disciplines, speaker identification remains one of the most challenging tasks in forensic phonetics. The reason for this is the fact that our knowledge of how identity is reflected in the acoustic signal is still limited. The present study aims to contribute to the search of speaker-specific cues by examining spectral properties of the source signal. Specifically, it examines to what extent three short-term measures of spectral tilt, namely H1-H2, H1-A1 and H1-A3, can discriminate 16 Czech female speakers. It also addresses the influence of vowel quality, syllable status with respect to stress and position of stress group in the utterance on the values of these measures. The results show that these parameters do have some discriminative power, though the contribution of individual parameters differs. The study indicates that discrimination of speakers is the most successful in stressed syllables and argues that individual vowels could differ in their usefulness for speaker identification. The results of LDA based on these short-term measures of spectral tilt were complemented with long-term measures, namely alpha index, Kitzing index and Hammarberg index which quantify the slope of the LTAS. The present study suggests that phonatory modifications convey some speaker-specific information and could enhance speaker identification.

Key words: voice, long-term average spectrum, spectral slope, speaker identity, forensic phonetics