



ABSTRACT

**AN EXCITATION ANALYSIS AND SYNTHESIS METHOD
FOR CODING OF AUDIO AND SPEECH SIGNALS**

This disclosure presents a multi-mode CELP coder (Fig. 1) which exploits a pitch synchronous concept for bitrate reduction. By classifying the signal into three modes, different coding techniques may be applied to code the secondary residual (S1.16). The coding techniques are algebraic codebook excited linear prediction (1.11), extended (1.12) and stochastic (1.13) excitation coding. Among these three coding techniques for the secondary residual (S1.16), the extended excitation (1.12) of the previous excitation is important for reduction of bitrate requirements during voiced frames. While the bitrate is reduced by extended excitation (1.12), the speech or audio quality can be maintained at a high level through using joint optimization of the adaptive codebook (1.10) and the extended excitation (1.12). The computational load only increases marginally for this joint optimization process.

Fig. 1