EFFICIENT NON–UNIFORM FILTER–BANK EQUALIZER
(WedAmPO2)

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Abstract :
An efficient realization of a low delay filter–bank will be proposed, which can be regarded as a filter–bank used as equalizer with either fixed or time–varying spectral gain factors. The proposed filter–bank equalizer (FBE) results in a time–domain filter whose coefficients are adapted in the (short–term) spectral–domain. Perfect signal reconstruction is obtained for a broad class of spectral transforms, including the generalized discrete Fourier transform (GDT), the Walsh and Hadamard transform, with less restrictions compared to a common analysis–synthesis filter–bank (AS FB). A non–uniform frequency resolution can be achieved by frequency warping based on an allpass transformation. In this case, the filter–bank equalizer can achieve near perfect signal reconstruction with lower effort than for an allpass transformed analysis–synthesis filter–bank. The filter–bank equalizer is especially useful for adaptive filtering requiring a low signal delay with coefficient adaptation based on frequency–domain algorithms.