less ladder network by means of linear transformation has been presented. The port variables of the voltage-current domain are linearly transformed to a new variable domain, which enables a systematic simulation of an active network from the original passive ladder structure. The application of the transformation approach is suggested to start from the load-side section to ensure the existence of direct filter output and to avoid the undesirable situation in which the active realization takes a very complicated shape which requires many operational amplifiers. The passive ladder network is partitioned into repeating reactive segments which are subject to the linear transformation. The repeating segments are selected to contain two reactive arms, series and shunt. The matrices used for the linear transformation are common to all the sections except the load-side one.

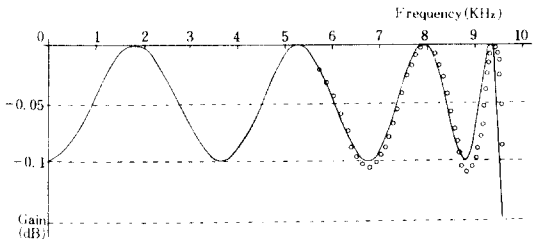

Fig.15. The response of the 8th-order low-pass filter of Fig. 14(b).

The appropriate selection of linear transformation matrices and of the structure of repeating reactive sections has resulted in a systematic procedure of the active realization of low-pass filters from doubly terminated lossless ladder networks without any regard to the degree of complexity of the original ladder structures. The active network realized by means of the method developed here in has less operational amplifiers than those realized via other methods such as scattering parameter approach[5], wave active filters[6], signal-flow graph simulation[7] and the latest linear transformation approach[2].

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