Logarithmic stabilization of an acoustic system with a damping term

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We study the problem of stabilization for the acoustic system with a spatially distributed damping. Without imposing any hypotheses on the structural properties of the damping term, we identify logarithmic decay of solutions with growing time. Logarithmic decay rate is shown by using a frequency domain method and combines a contradiction argument with the multiplier technique and a new Carleman estimate to carry out a special analysis for the resolvent.