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Abstract for an Invited Paper  
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**The temperature dependence of jet transport coefficients**

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We review the theory of pQCD based jet energy loss in dense matter. In particular, we will focus on the leading transport coefficients that cause the modification of hard jets and how they arise in the various perturbative schemes. This will be followed by a review of the recent work by the JET collaboration which carried out the first phenomenological extraction of the temperature dependence of the leading coefficient  $\hat{q}$ . We conclude with discussions on the theoretical calculations and expectations for the temperature dependence of  $\hat{q}$  and their significance.