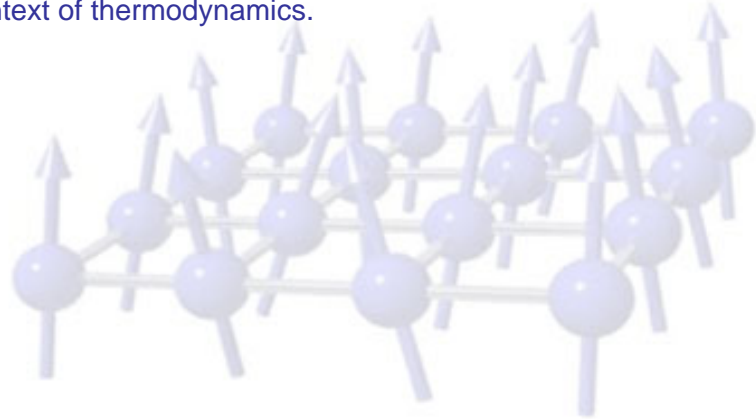


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Energy concentration in atom-cavity systems

The spontaneous emission of photons from optical cavities and from individually trapped atoms has been studied extensively in the framework of quantum optics. Theoretical predictions based on the rotating wave approximation (RWA) are in general in very good agreement with experimental findings. However, current experiments aim at combining better and better cavities with large numbers of tightly confined atoms. Here we predict an energy concentrating mechanism in the behavior of such a composite quantum system which cannot be described by the RWA. Its result is the continuous leakage of photon through the cavity mirrors even in the absence of external driving. Finally, we discuss the predicted phenomenon in the context of thermodynamics.



18. Dezember 2009, 14:00 Uhr

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