**Fermionized photons in one-dimensional coupled cavities**[1] DAVID
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— We consider the properties of a one-dimensional array of evanescently coupled
high-finesse cavities each containing a single neutral atom, in the limit of low photon
densities. The ground state of the corresponding Jaynes-Cummings-Hubbard (JCH)
model is obtained numerically using the Density Matrix Renormalization Group
algorithm. We find strong evidence for the existence of a Tonks-Girardeau phase,
in which the photons are strongly fermionized, between the Mott-insulating and
superfluid phases as a function of the inter-cavity coupling. Results for photon and
spin excitation densities, one- and two-body correlation functions, and superfluid
and condensate fractions are all found to be consistent with this conclusion.

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