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Non-particle dark matter from Hubble parameter

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The measurements of the Hubble parameter using the cosmic microwave background radiation appear to be inconsistent with the measurements of this parameter using Cepheid variable stars. This inconsistency may be a result of using the Λ CDM cosmology, which assumes pressureless dark matter, in extrapolating the data from the recombination time to the present time. We show that both measurements are consistent if dark matter satisfies an equation of state in which the pressure p and the energy density ϵ are related by $p = w\epsilon$ with a negative value of w. The data give $w \approx -0.01$. The negative value of w indicates that dark matter would not be formed by particles, which is consistent with the lack of experimental evidence for them.

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