The Value of Sommerfeld’s Fine-structure Constant as a Consequence of the Planck-Aether Hypothesis

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A value of the fine-structure constant at the unification energy is obtained by a dimensional analysis of quantum gravity and fluid dynamics. The derivation assumes that the vacuum is a superfluid made up of positive and negative Planck mass particles obeying an exactly nonrelativistic law of motion with Lorentz invariance a low energy approximation. The dimensional analysis presented gives a value for the fine-structure constant in good agreement with the empirical value $\frac{1}{\alpha} \approx 25$. 