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Supersymmetry from a Fundamental Statistical Theory: Further Implications ROLAND ALLEN, SEIICHIROU YOKOO, Physics Dept., Texas A&M Univ. — (1) The most natural form of the supersymmetry in the preceding abstract appears to contain no auxiliary fields, but to require instead that there are two sfermions for each fundamental fermion, and two gauginos for each gauge boson. The supersymmetry algebra and physical predictions are then quite unconventional. (2) The theory of the previous abstract leads to many features of standard physics, but does not produce the terms in the action for noninteracting gauge, gaugino, gravitational, and gravitino fields. We interpret these terms as arising from a response of the vacuum that is analogous to the Landau diamagnetic response of a metal. The smallness of the cosmological constant then results from a simple principle: The vacuum does not contribute to the stress-energy tensor, but is instead responsible for the Einstein-Hilbert action itself. (3) The initial statistical theory suggests a mechanism for scale-invariant fluctuations which is quite different from that of inflationary models.

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