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BRS Cohomology of the Chiral Superfield

J. A. Dixon*

Theory Group, Physics Department, University of Texas, Austin, TX 78712, USA

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Abstract. As a start in a search for possible undiscovered anomalies which might break supersymmetry, a general calculation of BRS cohomology for the Wess Zumino chiral multiplet is performed. The calculation is done using spectral sequences in Fock space. It encompasses the vector space of all integrated local polynomials in the fields and their derivatives. This calculation shows that the BRS cohomology space contains an infinite number of polynomials with ghost charge one. Examples of these polynomials are given. All presently known examples possess uncontracted Lorentz spinor (and possibly vector) indices. A simple extension of these results to super Yang Mills theory indicates that there may be previously unnoticed anomalies in that theory.

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