The Lorentz Group and Singular Lorentz Transformations

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abstract

Contents

I. INFINITESIMAL LORENTZ TRANSFORMATIONS

There are Lorentz transformations that are small perturbations of the identity transformation and so $U \in SL(2,\mathbb{C})$ has the form

$$U = \begin{pmatrix} 1+\epsilon a & \epsilon b \\ \epsilon c & 1+\epsilon f \end{pmatrix},$$

where $a, b, c, f \in \mathbb{C}$ and ϵ is a small real parameter. Here terms of order ϵ^2 will be neglected, so the determinant is calculated as

$$\det(U) = 1 + O(\epsilon^2)$$

II. ACKNOWLEDGEMENTS