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Geometric Fixed Hyperplane Rotations of SU(1,1) and Sp(2,R)
KHALDI KHALIDA, KEITH ANDREW, ERIC STEINFELDS, IVAN NOVIKOV, Western Kentucky University — We develop the tools needed to provide a geometric demonstration of the isomorphisms exhibited between the groups SU(1,1) and Sp(2,R) by using elements of SU(2,C). Using the matrix representation in terms of 2x2 complex matrices with unit determinant the action of each group can be seen as transformations with respect to the fixed hyperplanes for the coordinates x_1, x_2 and x_3. The construction is based upon the determinant constraint expressed in terms of the spacetime interval for Hermetian generators that are from SU(2,C). This work follows the strong connection used in twistor theory in a four dimensional complexified spacetime of signature (2, 2) based upon the isomorphism between Spin(4,2) and SU(2,2).

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