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Rotational Consequences of Lorentz Symmetries in Hyperbolic Phase Space FELIX T. SMITH — A hyperbolically curved position space when combined with a relativistic velocity-momentum space forms a phase space with the symmetries of a direct product double Lorentz group, expressed by 8×8 matrices. (See an adjoining Abstract, "Lorentz Symmetries of a Doubly Hyperbolic Phase Space.") Its rotational subgroup too is a direct product, combining rotations in position space with those in momentum space to form a total angular momentum **J** and an unfamiliar contra-angular momentum **Q**, a pseudovector whose coupling with other vectors vanishes in the absence of spatial and velocity space curvature. Its quantum numbers and properties may label some particle states. The second-order couplings populating states of **Q** arise from a combination of both position and velocity space curvatures; they are comparable in nature to the Thomas precession process, which can itself be looked upon as a second-order effect of curvature in relativistic velocity space. Processes altering **Q** values will therefore occur preferentially at relativistic velocities in regions of high gravitational curvature.

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