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Translations and Rotations are correlated in Granular Gases[1] ANNETTE ZIPPELIUS, University of Goettingen, NICOLAI BRILLIANTOV, University of Potsdam, THORSTEN POESCHEL, Charite, HU Berlin, TILL KRANZ, University of Goettingen — In a granular gas of rough spheres the axis of rotation is shown to be correlated with the translational velocity of the partciles. The average relative orientation of angular and linear velocities depends on the parameters which characterise the dissipative nature of the collision. We derive a simple theory for these correlations and validate it with numerical simulations for a wide range of normal and tangential restitution.The limit of smooth spheres is shown to be singular: even an arbitrarily small roughness of the particles gives rise to orientational correlations.

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