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Elastic Gauge Fields in Weyl Semimetals[1] ALBERTO CORTIJO, YAGO FERREIROS, KARL LANDSTEINER, MARIA ANGELES HERNANDEZ VOZMEDIANO, Consejo Superior de Investigaciones Cientificas — We show that, as it happens in graphene, elastic deformations couple to the electronic degrees of freedom as pseudo gauge fields in Weyl semimetals. We derive the form of the elastic gauge fields in a tight-binding model hosting Weyl nodes and see that this vector electron-phonon coupling is chiral, providing an example of axial gauge fields in three dimensions. As an example of the new response functions that arise associated to these elastic gauge fields, we derive a non-zero phonon Hall viscosity for the neutral system at zero temperature. The axial nature of the fields provides a test of the chiral anomaly in high energy with three axial vector couplings.

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