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Band geometry of fractional topological insulators RAHUL ROY, University of California, Los Angeles — Recent numerical simulations of flat band models with interactions which show clear evidence of fractionalized topological phases in the absence of a net magnetic field have generated a great deal of interest. We provide an explanation for these observations by showing that the physics of these systems is the same as that of conventional fractional quantum Hall phases in the lowest Landau level under certain ideal conditions which can be specified in terms of the Berry curvature and the Fubini study metric of the topological band. In particular, we show that when these ideal conditions hold, the density operators projected to the topological band obey the celebrated W_∞ algebra. Our approach provides a quantitative way of testing the suitability of topological bands for hosting fractionalized phases.

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