LINEAR ISOMETRIES AND BISEPARATING MAPS BETWEEN SPACES OF VECTOR-VALUED LIPSCHITZ FUNCTIONS

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ABSTRACT. For metric spaces X and Y and normed spaces E and F, we study the general form of linear biseparating maps and surjective isometries between spaces $\mathrm{Lip}(X, E)$ and $\mathrm{Lip}(Y, F)$ of vector-valued Lipschitz functions.

In the case of biseparating maps, we give their general description as weighted composition maps when X and Y are assumed to be *complete*. On the other hand, under some additional assumptions, automatic continuity is derived.

As for the surjective linear isometries, we deal with the case when E and F are *strictly convex*. We study the following three questions:

(1) Characterize those base spaces X and Y for which all isometries are weighted composition maps.
(2) Give a condition independent of base spaces under which all isometries are weighted composition maps.
(3) Provide the general form of an isometry, both when it is a weighted composition map and when it is not.

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