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Sean Sovine* (sovine5@marshall.edu), Marshall University. *Weihrauch reducibility and finite dimensional subspaces.*

We study the Weihrauch problem of producing a finite dimensional or one dimensional subspace of a countable vector space, and related problems for producing finite dimensional subsets of a countable matroid. This extends Reverse Mathematics work of Downey, Hirschfeldt, Kach, Lempp, Mileti, and Montalbán (2007) and recent work of Hirst and Mummert (2016). We also study the Weihrauch problem of decomposing a countable vector space or countable matroid into one dimensional subspaces.

[1] Rodney G. Downey, Denis R. Hirschfeldt, Asher M. Kach, Steffen Lempp, Joseph R. Mileti, and Antonio Montalbán. Subspaces of computable vector spaces. *Journal of Algebra*, vol. 314 (2007), no. 2, pp. 888–894.

[2] Jerry Hirst and Carl Mummert. Reverse mathematics of matroids. *Lecture Notes In Computer Science*. To appear (2016).

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