

## **Codes and matroid structures**

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### **Abstract:**

We define the higher weight hierarchies of linear codes and matroids, and describe how they are determined by Betti numbers of minimal resolutions of Stanley-Reisner rings of the simplicial complexes determined by the matroids in questions. We give examples, and also describe properties concerning facet ideals of the same simplicial complexes. We will also describe briefly linear codes produced using some explicit algebraic-geometric varieties over finite fields, and how the higher weight hierarchies of such codes are determined by geometric properties of the varieties.