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Complex Matroids

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Matroid theory can be viewed as an abstraction of some combinatorial properties of linear dependencies among elements of vector spaces. The theory of oriented matroids specifically deals with the combinatorics of linear dependencies over the real numbers. A substantial part of the richness of those theories lies in the fact that they each can be axiomatized in a number of equivalent ways. Some work has been devoted to the search for a similar structure for linear dependencies over the complex numbers.

After a quick review of matroids and oriented matroids, we will present our attempt at a theory of “complex matroids” that shares much of the structural richness of oriented matroid theory.
