

Abstract Submitted  
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**Dark Matter Self Interaction Limits: Determination and Implications** PAUL LESSARD, The Evergreen State College — The first studies of the lensing events around the Bullet cluster have shown that the dark matter halos of galaxy clusters are collisionless. This rather fortunate structure in the universe becomes an excellent laboratory for setting limits on the source of dark matter particle interaction. Markevitch et al. in 2004 explored three simple methods for determining the dark matter self interaction cross section to mass ratio.. A new strong and weak lensing derived density map of the cluster has been created, advancing the accuracy of these limits. A subsequent Markevitch et al. paper was released April of this year with a full n-body simulation of the collision putting giving us the best, although not the strongest, limit on the dark matter self interaction cross-section to mass ratio. Furthermore we are now at such a point as to ask what these limits tell us. Axions and SUSY wimps theoretically fall well under this threshold leaving their DM candidacy untouched if not strengthened. Other candidates like Q-balls however, are not guaranteed to fall below this limit. It is my goal to characterize Q-ball dark matter scenarios coincident with this new experimental limit.

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