

Revisiting Q-ball dark matter: closer look at interaction with ordinary matter

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In supersymmetric extensions of the standard model, bosonic partner of quarks (squarks) tend to form an extended objects in the presence of large baryon number, called Q-ball.

Q-balls surviving evaporation and diffusion in the Early Universe contribute to (part of) observed dark matter abundance.

Since Q-ball dark matter has macroscopic mass like gram or heavier (flux limited), it is challenging to search for it in conventional direct detection experiments, though it has a large geometrical cross section like barn or larger.

On the other hand, new opportunity in so-called paleo detector experiments motivates us to examine interaction between Q-ball dark matter and ordinary matter more closely.

There are presumably dominant processes: absorption of nucleon and conversion of nucleon into anti-nucleon. In this talk, after introducing Q-ball dark matter, we discuss these processes with subtleties.

Do you plan to give the talk in person?

Yes

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