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## Calcium isotope enrichment by means of multi-channel counter-current electrophoresis (MCCCE) for the study of particle and nuclear physics

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We developed a new method for enrichment of large amount of calcium isotopes for the future study of  $^{48}\text{Ca}$  double beta decay. The method is the Multi-Channel Counter-Current Electrophoresis (MCCCE). We present the concept of the MCCCE where powerdensity in migration path is the key for the efficient enrichment of large amount of materials.

In the MCCCE, ions migrate in multi-channel on a boron nitride (BN) plate by which substantial increase of the power density can be achieved. We made a tiny prototype instrument with a 10 mm thick BN plate and obtained 3 for an enrichment factor as the ratio of abundance of  $^{48}\text{Ca}$  to  $^{43}\text{Ca}$  over that of natural abundance. It corresponds to 6 for the enrichment factor of  $^{48}\text{Ca}$  to  $^{40}\text{Ca}$ . Recently we obtained 10 for the enrichment factor by using 20 mm BN plate. This remarkably large enrichment factor demonstrates that the MCCCE is a realistic and promising method for the enrichment of large amount of ions. This method can be applied to many other elements and compounds.

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