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(54) Title (EN): METHOD AND APPARATUS FOR CONTROLLING CHARGED PARTICLES

(54) Title (FR): PROCEDE ET APPAREIL DE CONTROLE DE PARTICULES CHARGEES

(57) Abstract:

(EN): An apparatus and method for controlling charged particles. The charged particles comprise electrons and positive ions. A magnetic field having only point cusps is used to confine energetic injected electrons and so to generate a negative potential well. Positive ions injected into or created within the negative potential well are trapped therein. The magnetic field is generated by current-carrying elements arranged at positions spaced from but closely adjacent and parallel to edges of a polyhedron which has an even number of faces surrounding each vertex or corner. The current-carrying elements are spaced apart at their corners (the vertices of the polyhedron) so as not to touch, and the containing structures for the current-carrying coils of the magnetic-field-providing system are conformal to the fields so produced. Preferably, the coils are placed on the outboard side of the confining coils so as to increase electron confinement.

(FR): L'invention concerne un appareil et un procédé de contrôle de particules chargées. Les particules chargées contiennent des électrons et des ions positifs. Un champ magnétique comprenant uniquement des cuspidés de points est utilisé pour confiner des électrons énergétiques injectés et générer ainsi un puits de potentiel négatif. Les ions positifs injectés ou créés dans le puits de potentiel négatif y sont piégés. Le champ magnétique est généré par des éléments porteurs de courant disposés à des emplacements espacés des bords d'un polyèdre présentant un nombre pair de faces entourant chaque vertex ou coin, mais étroitement adjacents et parallèles auxdits bords. Les éléments porteurs de courant sont espacés au niveau de leurs coins (les vertex du polyèdre) de sorte à ne pas se toucher, et les structures contenant les bobines porteuses de courant du système générant les champs magnétiques sont conformées aux champs ainsi produits. Les bobines sont placées de préférence sur le côté extérieur des bobines de confinement, de sorte à augmenter le confinement des électrons.

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