Modification of Generating Functions For Dynamic Aperture Enlargement

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Particle accelerators are typically constrained in intensity of a beam due to a phenomenon known as the dynamic aperture (DA). This DA is typically determined by the elemental components of the lattice under consideration and is often constricted by the presence of nonlinear elements, such as sextupole magnets. However, the lattice may often be represented by an order n Taylor map, which in turn may be used to find a corresponding generating function. We examine the possibility of modifying the generating function that describes the map for a given lattice in such a way as to adjust only the nonlinear contributions to the map, while keeping the linear structure of the lattice the same, thereby increase the possible DA of the lattice.

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