

## **Exact Solution for the n-axis and Spin Tune for Rings with Siberian Snakes**

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We present a new, nonperturbative algorithm to calculate the n-axis in storage rings. We demonstrate the algorithm by obtaining the exact nonperturbative solution for the n-axis (and spin tune) for a model storage ring with one resonance driving term and one or more Siberian Snakes. Our solution contains some new functions, which we call "sine-Bessel functions". We confirm the spectrum of "Snake resonances" found by Lee and Tepikian using tracking and perturbation theory. We also obtain the exact nonperturbative solutions for several other model rings, including rings with a partial Type 3 Snake, as in the IUCF Cooler.