Modified Picard-Chebyshev Iteration (MPCI) stands out as a superior choice for satellite orbit calculations compared to other algorithms like RK4, RK8, ODE45, ODE78, and ODE113, particularly when optimization for matrix operations is not feasible due to hardware constraints. MPCI excels in this context due to its high accuracy and stability without relying on complex matrix operations. Unlike methods that may involve implicit or adaptive step size approaches that could require matrix inversion, MPCI utilizes Chebyshev polynomials and iterative refinement through Picard iteration. This approach ensures precision in satellite orbit calculations while circumventing the computational overhead associated with matrix optimizations, making it suitable for deployment on older, resource-constrained satellite hardware. MPCI's ability to deliver robust performance without the need for intensive matrix computations aligns well with the practical constraints and demands of satellite trajectory planning and orbital mechanics.