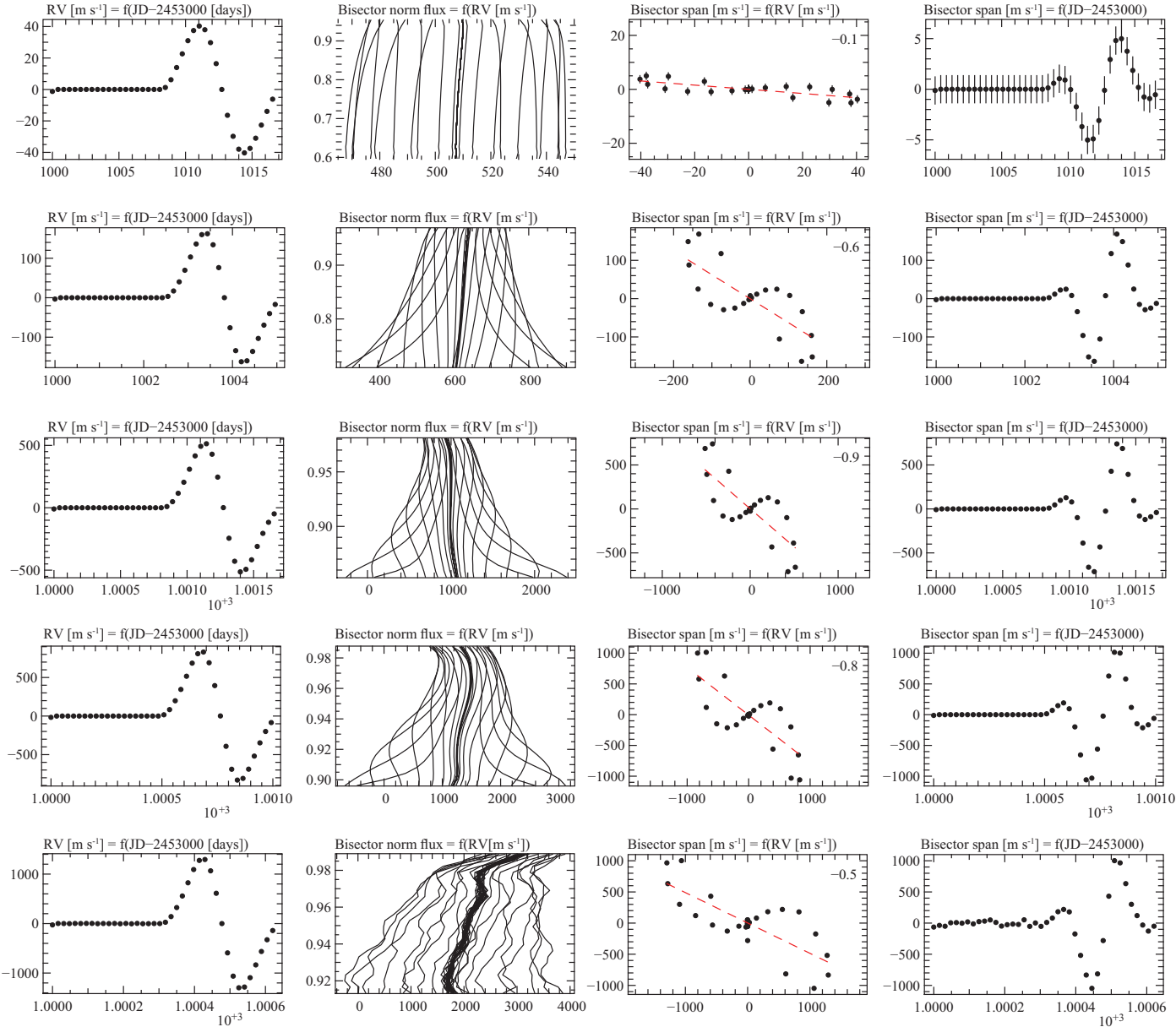1. Simulations results