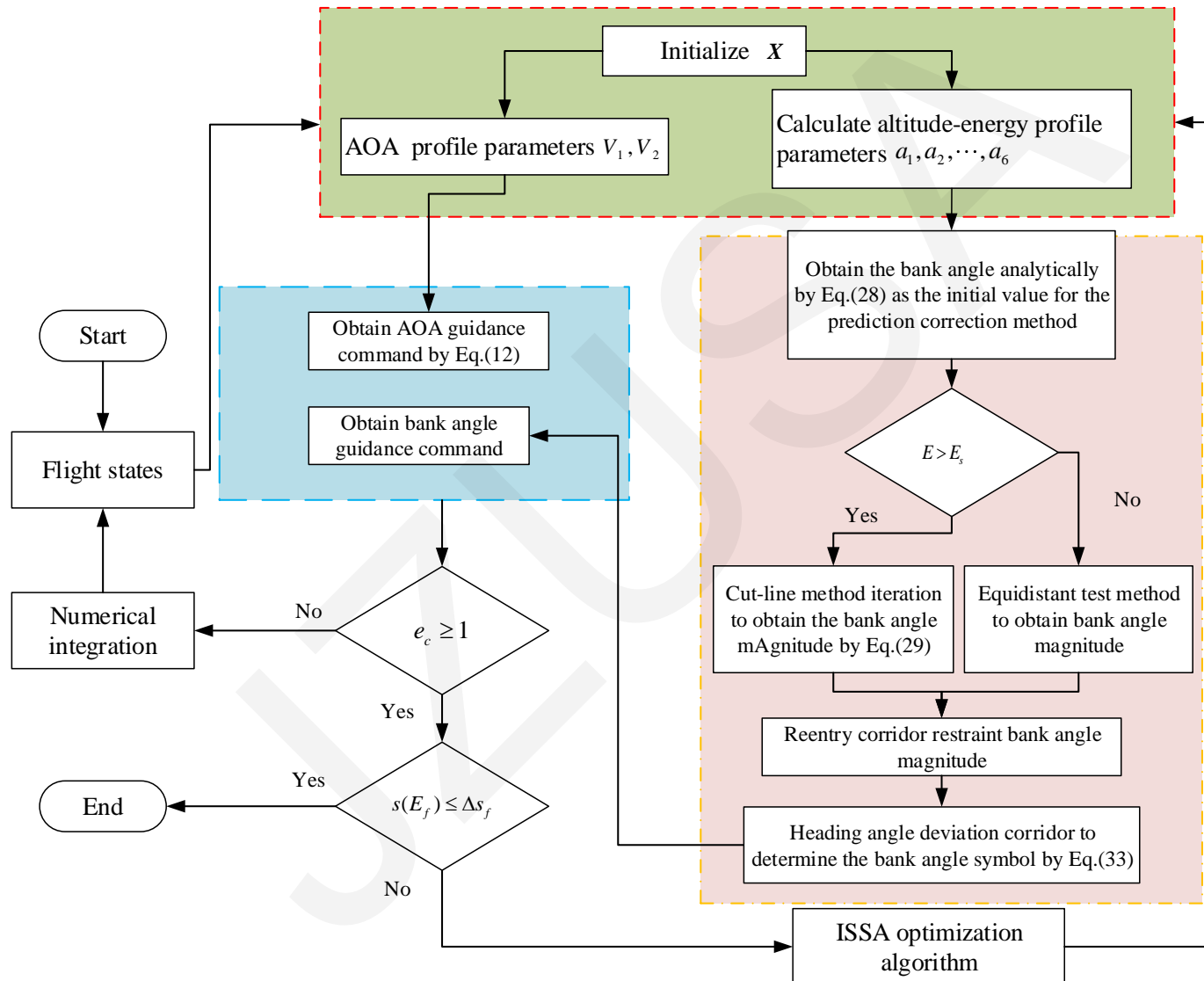


# Segmented predictor-corrector reentry guidance based on an analytical profile

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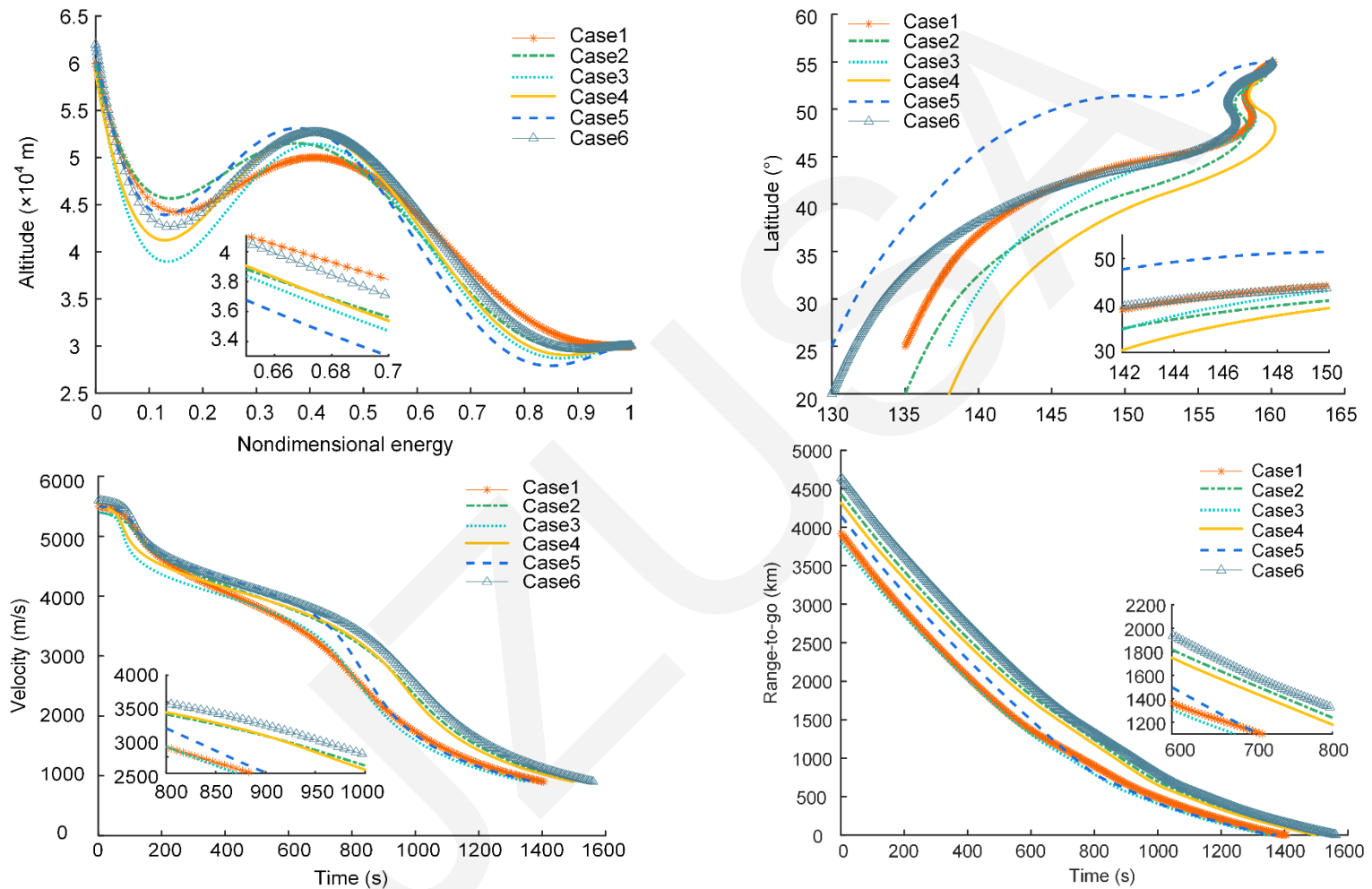
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# Overall Process of the Method



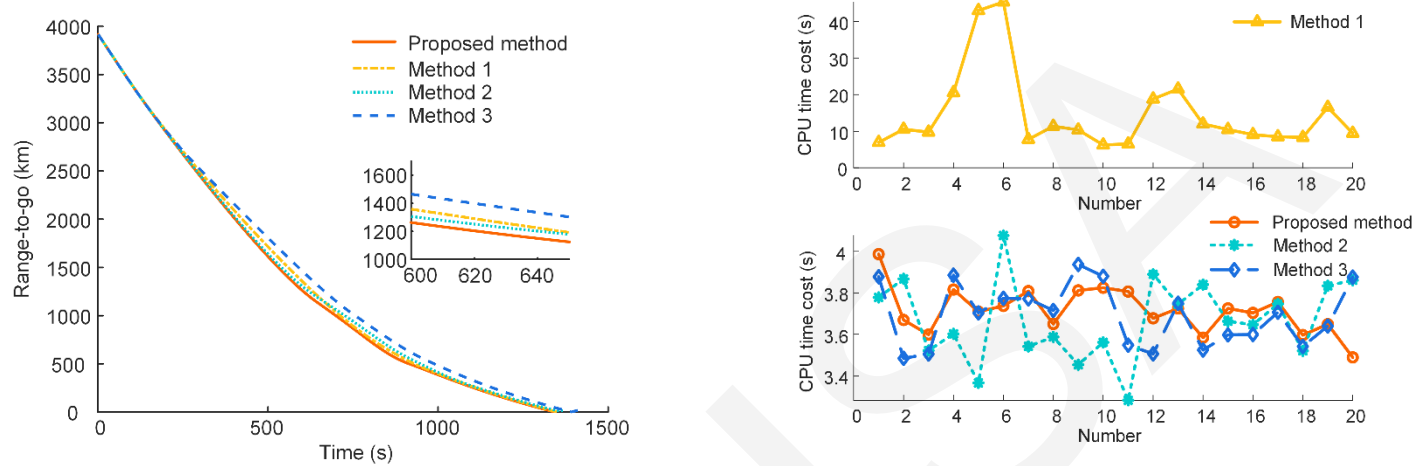
**Fig. 1 Flowchart of the proposed novel guidance algorithm**

# Testing simulation



**Fig. 2 Testing of the proposed analytical segmented predictor-corrector reentry guidance method**

# Comparisons Simulation

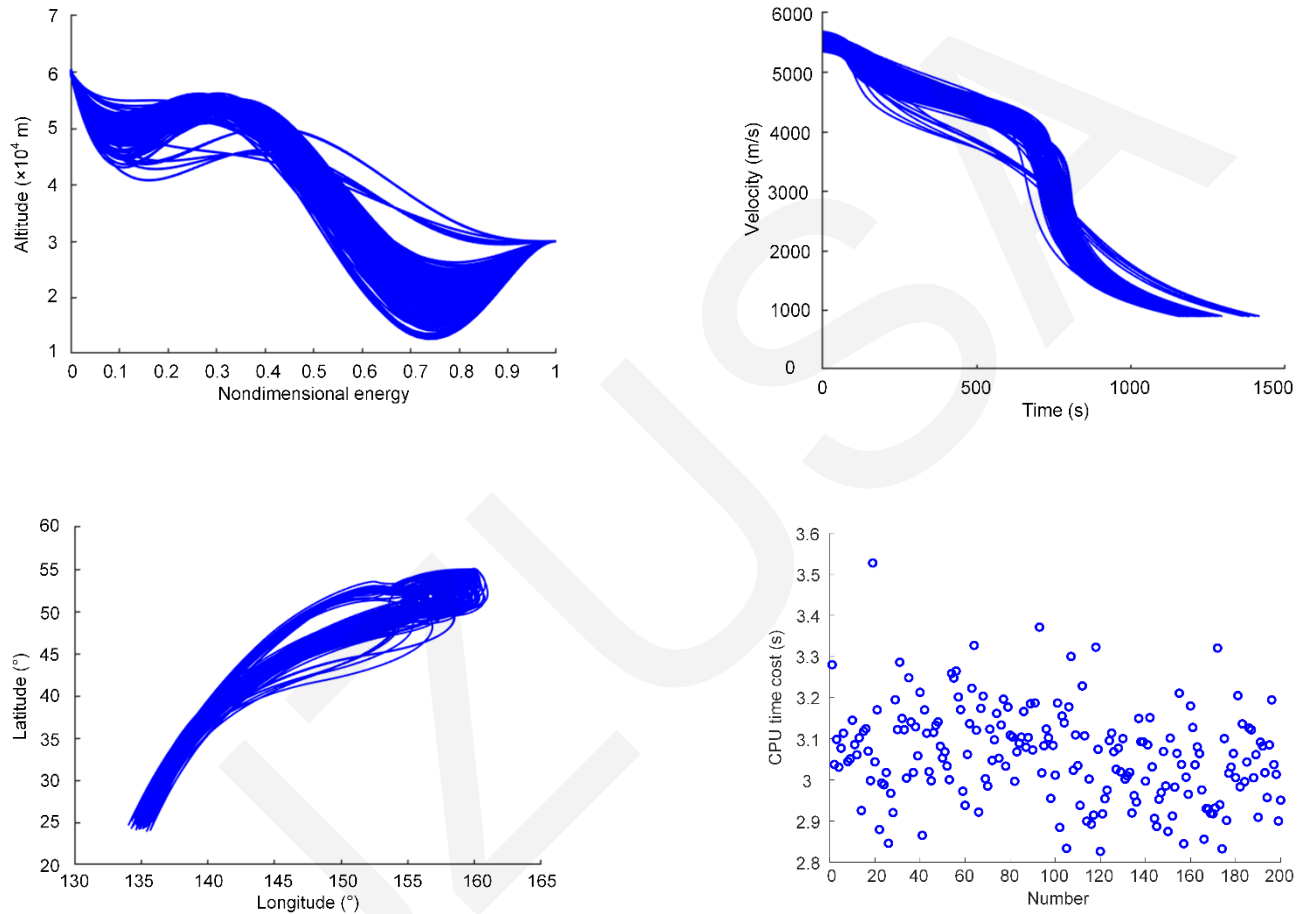


**Fig. 3 Part of the comparative experimental results**

**Table 1 Statistical results and time cost**

Time cost (s)	Best	Worst	Mean	Standard deviation
Proposed method	3.47	3.98	3.71	0.11
Method 1	6.25	45.29	14.64	11.04
Method 2	3.28	4.07	3.69	0.19
Method 3	3.48	3.93	3.70	0.14

# Monte-Carlo simulations



**Fig. 4. Part of the Monte-Carlo simulation results.**

# Conclusions

- Based on the altitude-energy profile , the bank angle can be roughly obtained with an analytical form.
- An analytical segmented prediction method of range-to-go is proposed, which greatly improves the efficiency of range-to-go prediction, reducing the calculation time from 14.64 s to 3.71 s compared to the integral method for predicting range-to-go.
- Simulation results from various scenes, comparative experiments of four methods, and MonteCarlo simulation show that our proposed method has good accuracy, fast calculation speed, and robustness, indicating good potential for online application.