IV Characteristics of Highly Dissipative coupled Josephson Junctions

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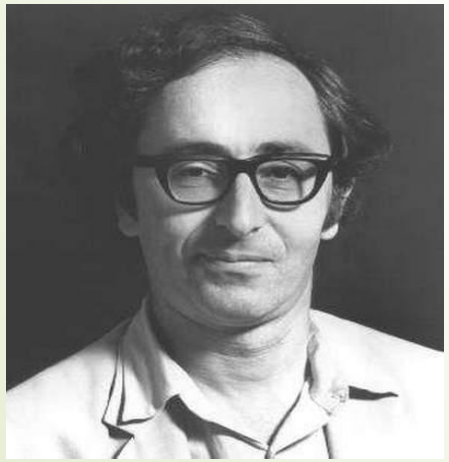
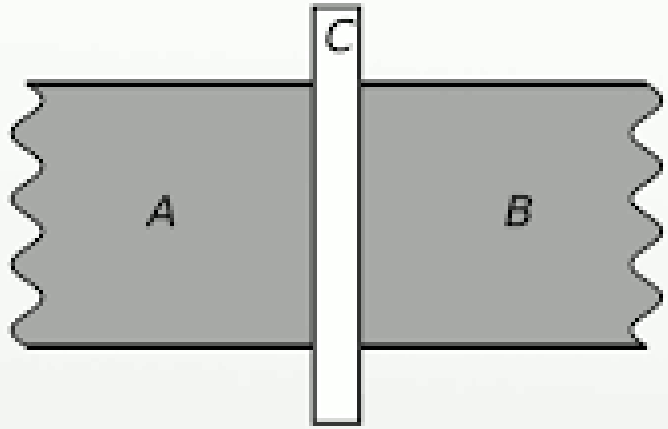
Josephson junction (JJ)

- A Josephson junction is made by sandwiching a thin layer of a non superconducting material between two layers of superconducting material.
- Brian David Josephson predicted in 1962 the mathematical relationships for the current and voltage across the weak link.





Josephson junction (JJ)

$$\begin{cases} \dfrac{\partial \varphi}{\partial t} = V \\ I = \dfrac{dV}{dt} + \sin\varphi + \beta \dfrac{\partial \varphi}{\partial t} \end{cases}$$

$$\beta = \frac{1}{R}\sqrt{\frac{\hbar}{2eI_cC}};$$

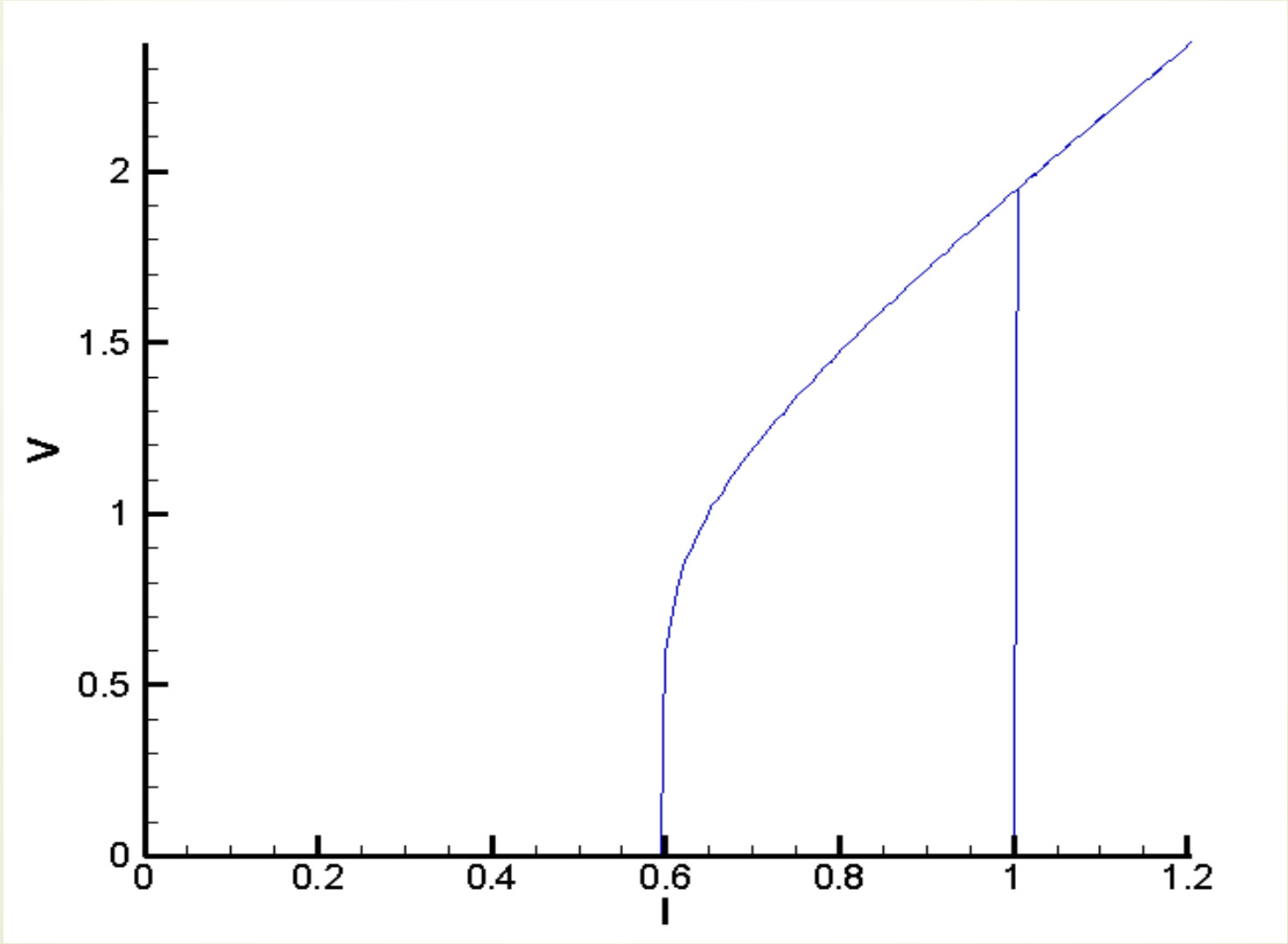
- This system of equations can be solved using fourth order Runge-Kutta method.

Josephson junction (JJ)

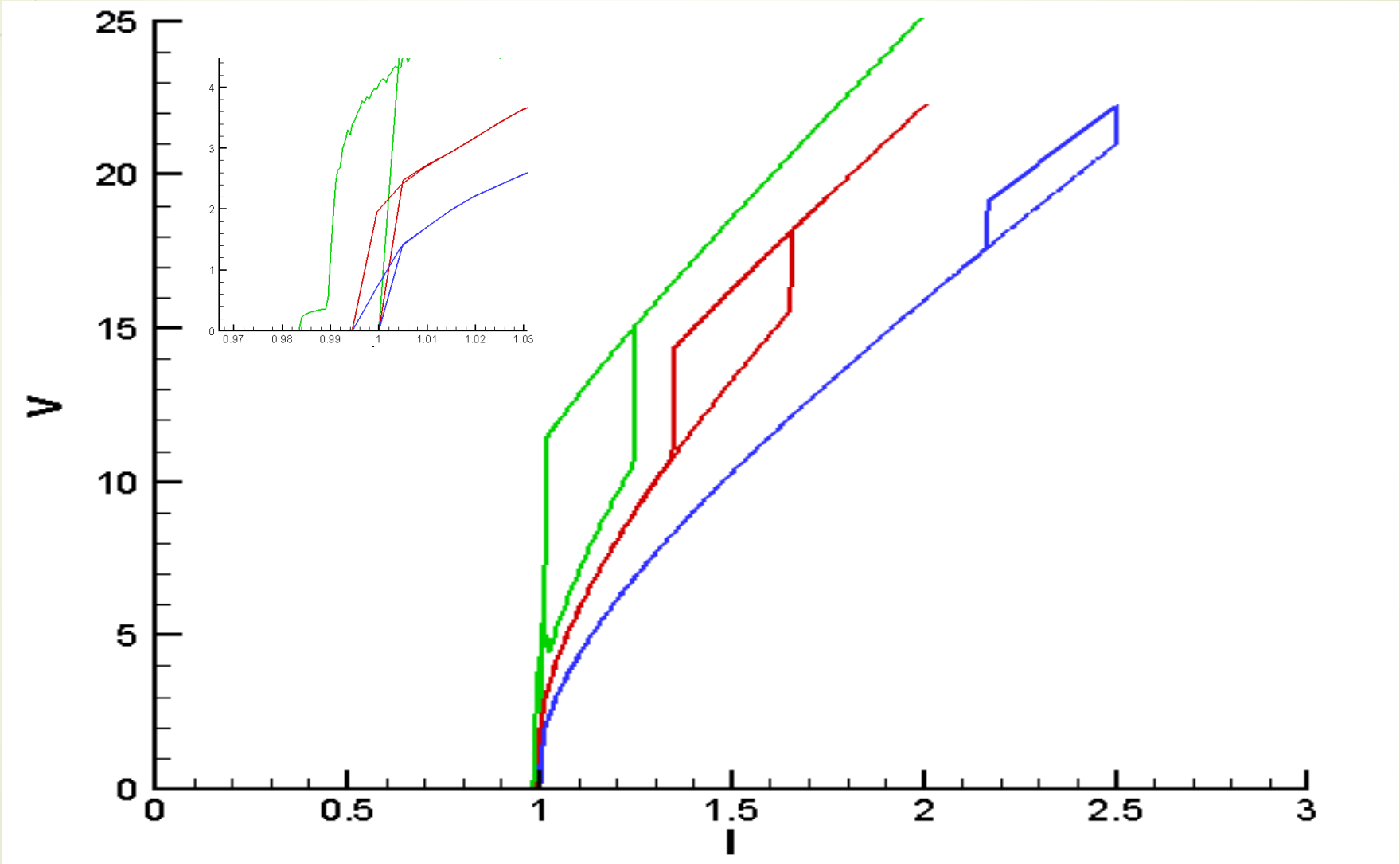
$$\begin{cases} \dfrac{\partial \varphi}{\partial t} = V \\ \dfrac{dV}{dt} = I - \sin\varphi - \beta \dfrac{\partial \varphi}{\partial t} \end{cases}$$

$$\beta = \frac{1}{R}\sqrt{\frac{\hbar}{2eI_cC}};$$

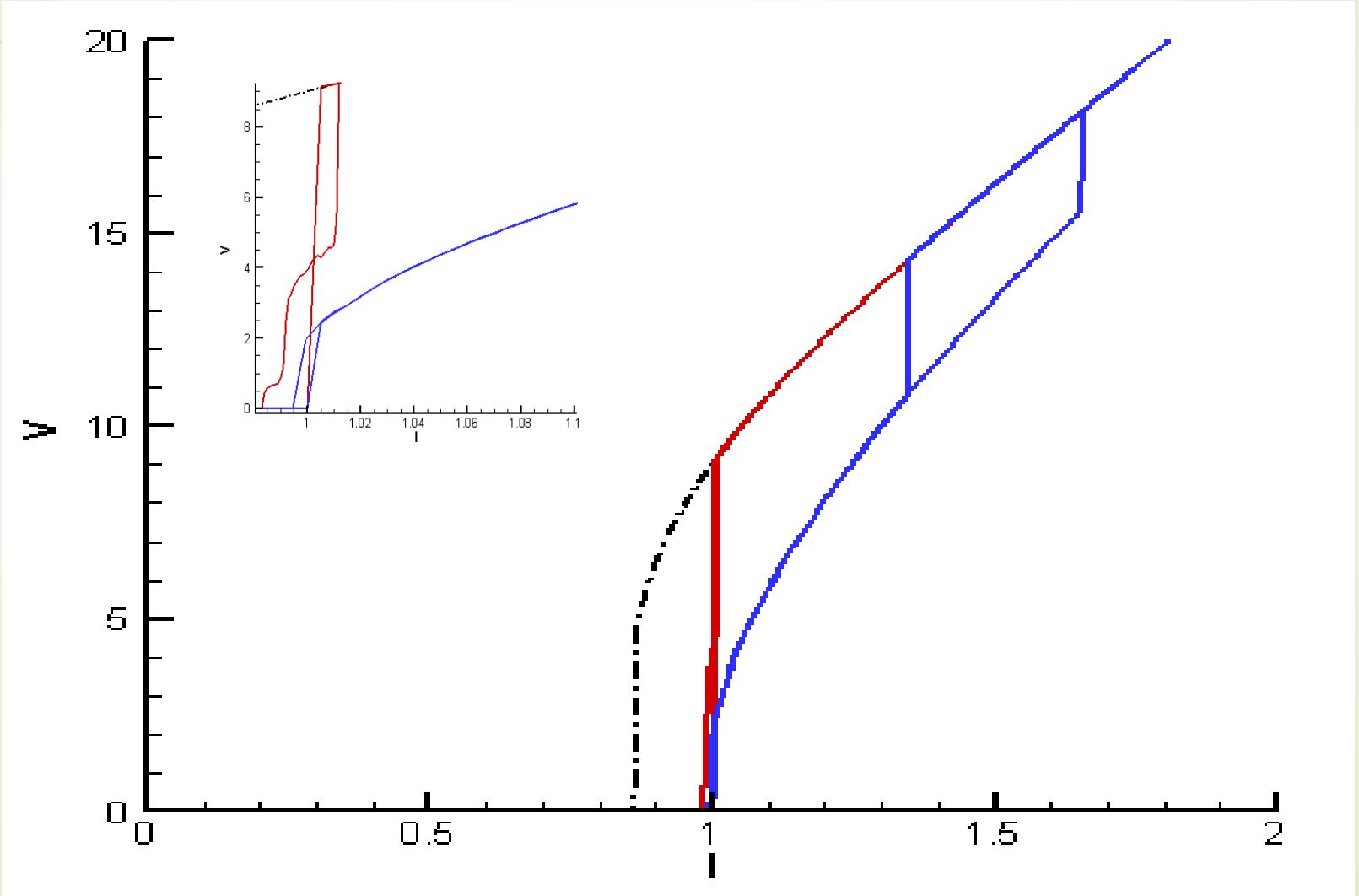
IV characteristics for highly dissipated JJ



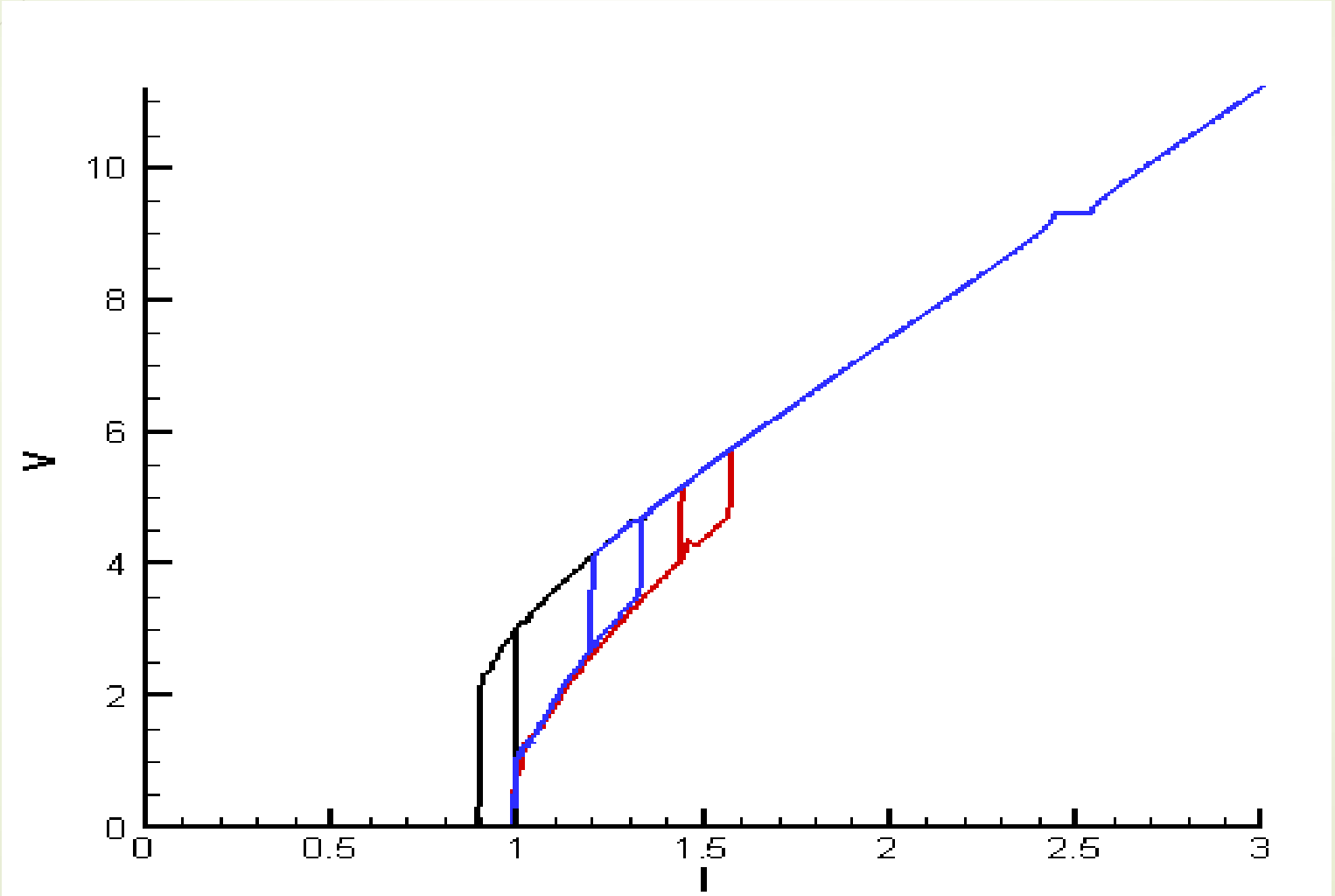
Second hysteresis zone



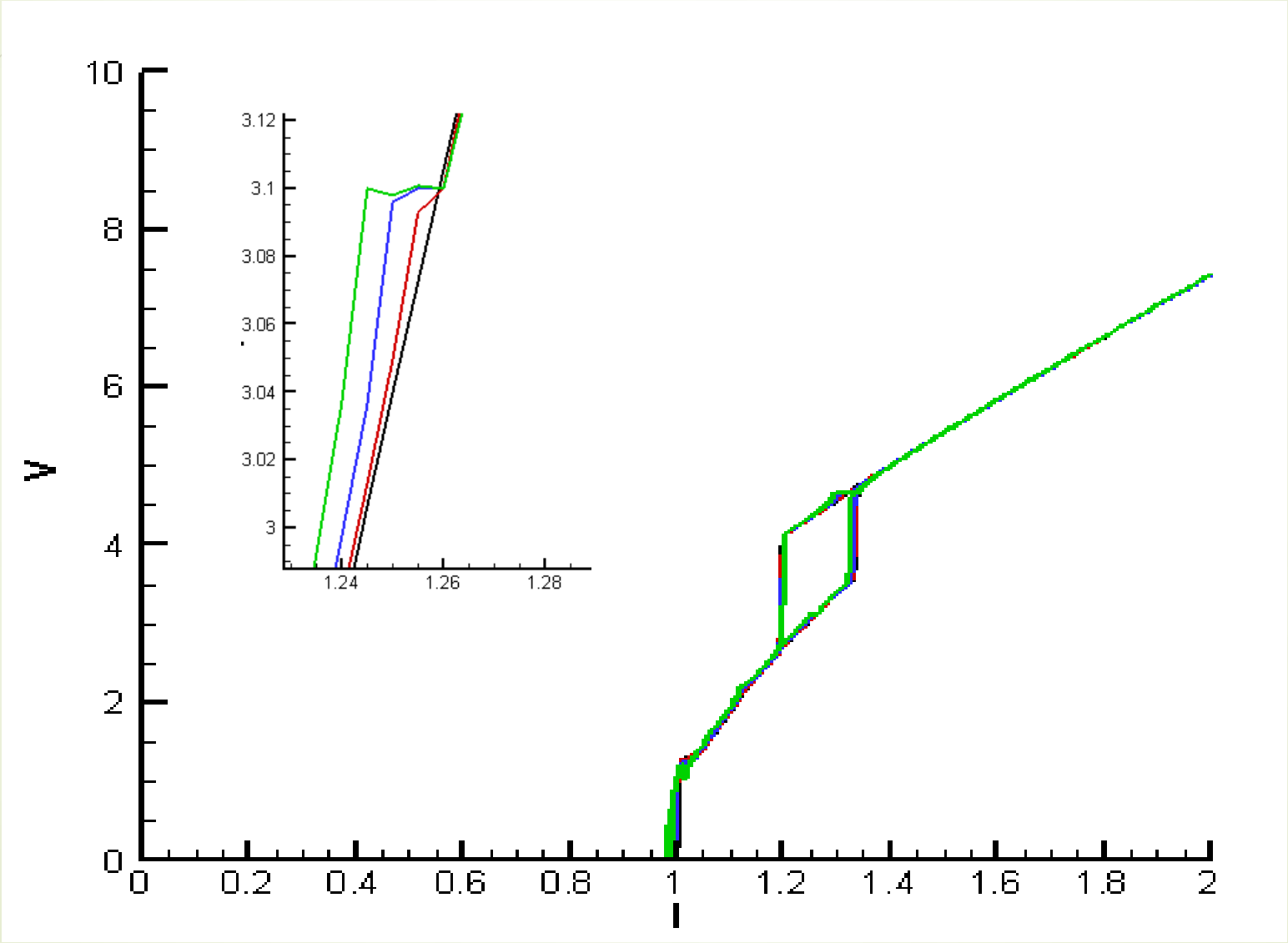
Second hysteresis zone (cont.)



Second hysteresis zone (cont.)



Second hysteresis zone (cont.)



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Thank You

Any Questions