**Multipoint Kinetics Methodology:**

The methodology documented here is meant to clarify and expand on the original theory developed by Avery [1]. It will also document where specific assumptions have been made in the theory.

The theory treats the reactor as a system of coupled regions each with their own precursor populations. In the original paper the coupling coefficient is defined as the expectation that a fission neutron in region *j* will cause a fission in region *i*.

The quantity commonly appears in the methodology and therefore Equation 1 is formally defined. is a measure of how subcritical region *i* is without the contribution of neutrons from the other regions.

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| --- | --- |
|  | Equation 1 |

The total fission neutron source in region *i* is defined as . The total fission neutron source in region i from fissions caused in region *j* is defined as . From these two definitions Equation 2 can be formally defined.

|  |  |
| --- | --- |
|  | Equation 2 |

The strict definition of the partial fission source is defined by XXX.

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|  | Equation 3 |

**References:**

[1] R. Avery, “Theory of Coupled Reactors”, Second United Nations International Conference on the Peaceful Uses of Atomic Energy, (1958).