

Scope

Estimation of the **uncertainty** in the final indicators (**Pu mass**) due to the uncertainty in input parameters.

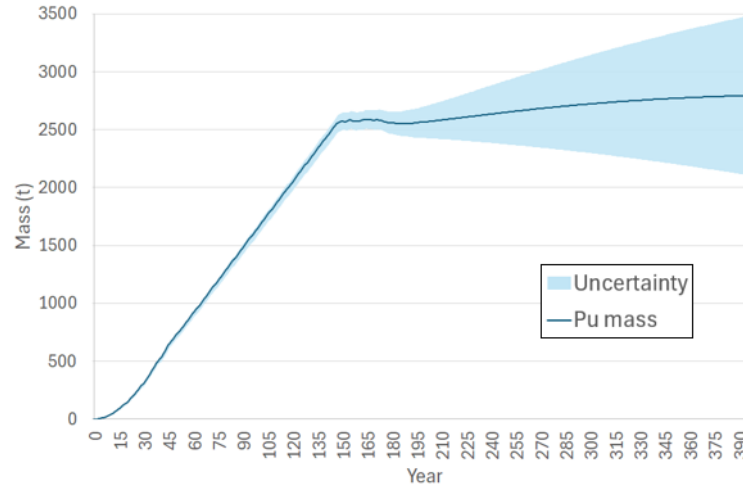
- Monte Carlo brute force methodology.
- **Extensive computational demand** is partially avoided with sensitivity methods.
- The **variance** with a first order expansion is

$$V(y) = \sum_{i=1}^d \left(\frac{\partial y}{\partial x_i} \right)^2 V(x_i)$$

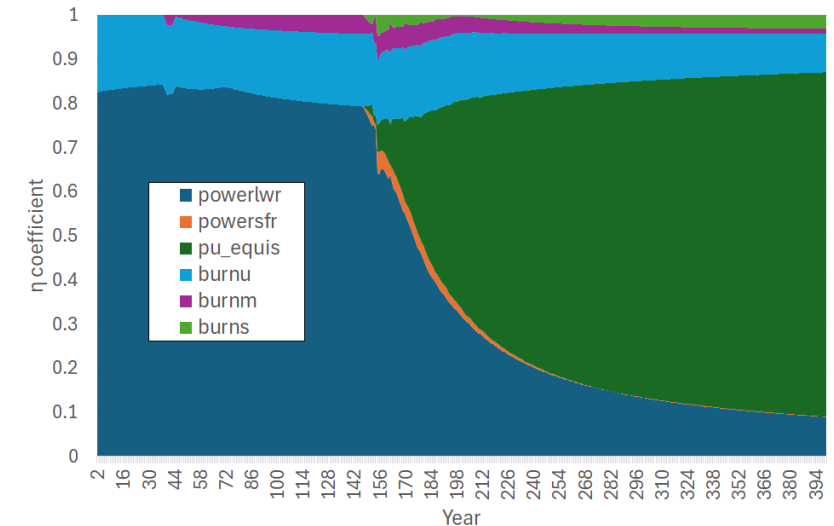
- With the sensitivity coefficient it is possible to obtain the **contributors** to the variance

$$\eta_i = \left(\frac{\partial y}{\partial x_i} \right)^2 \frac{V(x_i)}{V(y)}$$

Uncertainty (1 σ) in the Pu mass



Contributors



Input parameters with uncertainty

Power of the LWR fleet	Burn-up of LWR-UOX fuel
Power of the SFR fleet	Burn-up of LWR-MOX fuel
Content in Pu in the SFR fuel	Burn-up of SFR fuel

Conclusions

- High risk of scenario break
- Uncertainty small until transition to FR
- Power of the LWR fleet is the largest contributor to the uncertainty before transition.
- After transition, largest contributor is Pu content in SFR fuel