Cross section covariances in the resonance region

(BNL-LANL approach)

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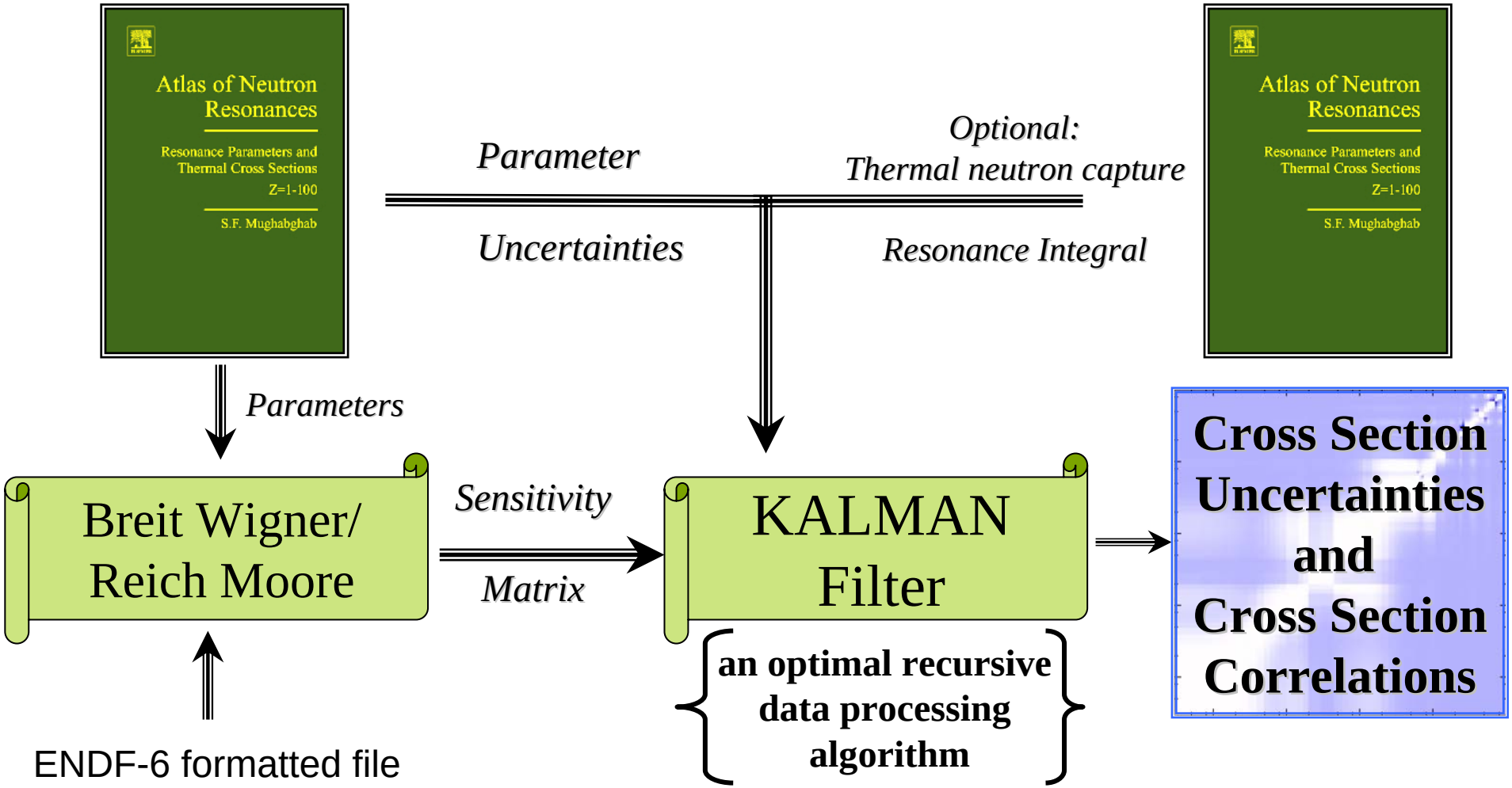
Covariance needs & goals

- Cross section covariances needed from thermal energy to 20 MeV
- Only a few isotopes in ENDF library with partial covariances (22 of almost 400)

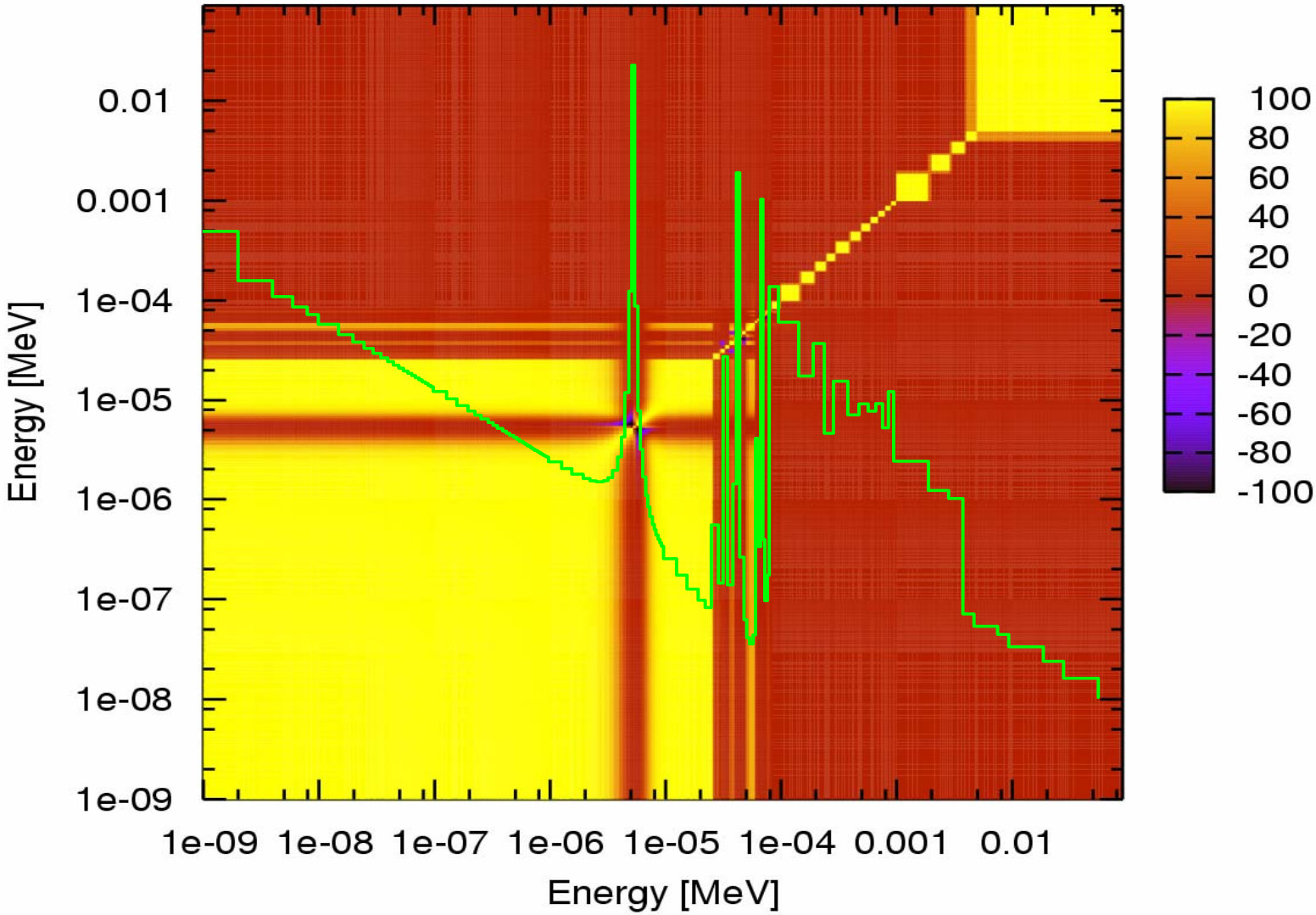
$\Downarrow$

- BNL-LANL: cross section covariance capabilities in the resonance and fast neutron region
- Test cases on 20 isotopes ($^{152\text{-}160}$Gd, ^{56,57}Fe, ^{19}F, ^{99}Tc, ^{234,236}U, ^{241}Am, ^{238,242}Pu and $^{242\text{-}245}$Cm)

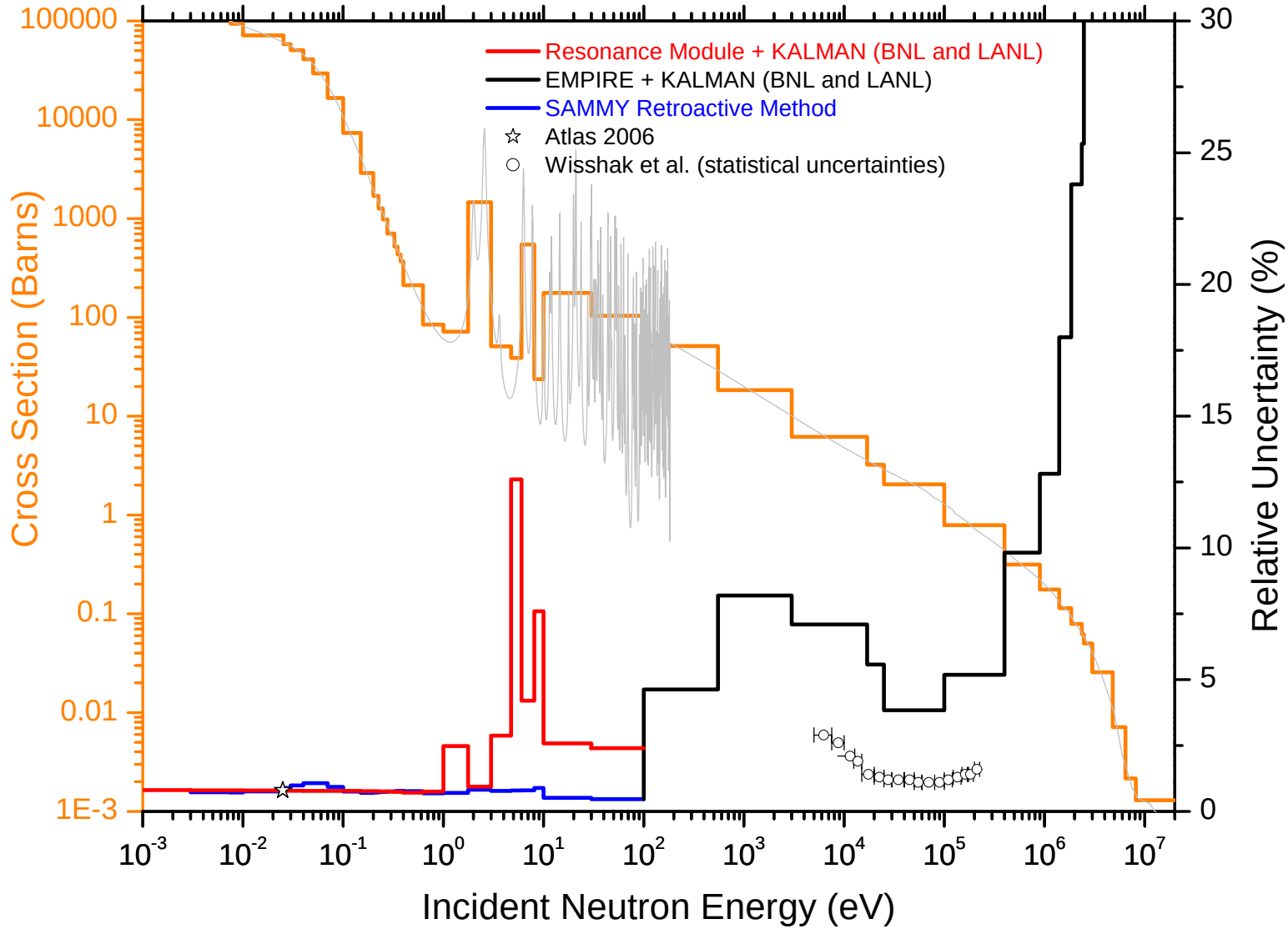
NNDC Capabilities

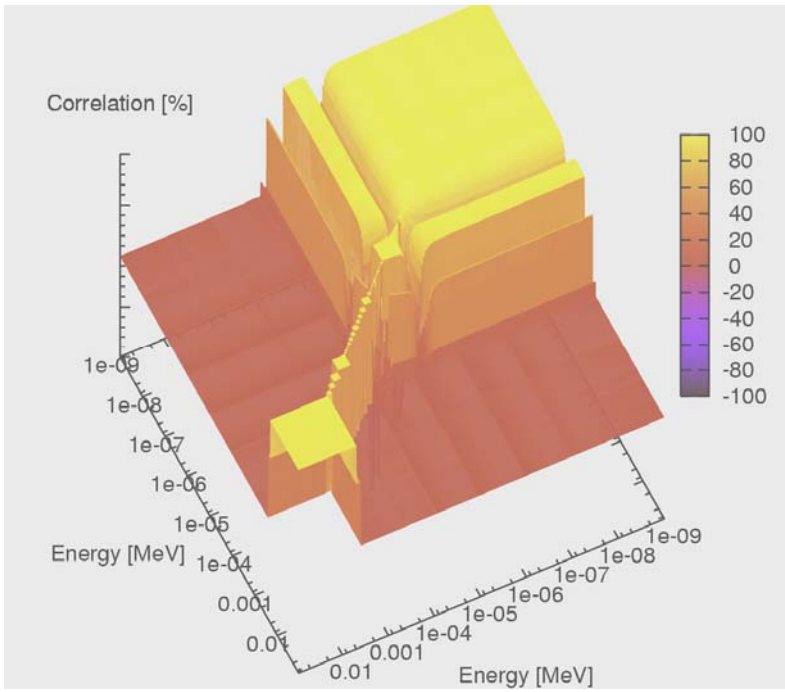


Example: Uranium-236(n,f) correlation



Example: Gd-155(n,γ) uncertainties



Future development

- Develop automatic procedure for estimate of covariances for a broad range of isotopes
- Produce covariances for WPEC/SG-26 (Salvatores) and contribute to the “low fidelity” covariance project
- Feedback from MCNP benchmarks (on k_{eff},…), TSUNAMI and refine the methodology