# Addressing the Need for More Systematic Testing of Covariances **before** their Release

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# Let's make sure that covariances are fully & thoroughly tested before the next release of ENDF/B

It was discussed at WANDA2020 that some issues were found by community and users in ENDF/B-VIII.0 covariances after their release. It was mentioned that more time for testing could be helpful to better ensure quality.

I want to discuss with the committee how we can:
a) Improve the timeline,
b) What codes we have available,
c) Maybe a bit what we should test.

Caveat: Don Smith already wrote everything down what should be tested: https://www.nndc.bnl.gov/csewg/covdocs.jsp

# What we may want to verify and validate nuclear-data covariances for?

- Mathematical properties: symmetry, positive semi-definiteness, valid correlations, sum-rules satisfied?

- Physics properties:
  - Unc. within reasonable limits? ( no >100% unc. for mu-bar)
  - Unc. realistic given spread in curated exp. data? – can use data from SG50
  - Unc. larger than standard unc. of reaction most exp. data are usually measured relative to?
  - Unc. realistic compared to template unc. and existing data?

- Are covariances coming from the same source as evaluation?

- Formats checking: can we process the covariances?

# The following talks will help us take stock what capabilities are available at BNL, LANL, LLNL, ORNL

It would be great if we could answer and discuss the following questions:

- What codes are available in the community for testing covariances?
- What are you testing?
- What do you do with questionable covariances or filling in the gaps?
- How much time would you need for beta-testing of covariances with current codes?
- What developments are needed for testing that satisfies your users?
- Discus: How should we proceed with deficient covariances?

From these talk and the discussion now, let's make a better plan for testing the next release.