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Presentation of the CALMAR-ECORCES spectrum adjustment package available at the NEA Data bank

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Adjustment methods are well known for the determination of a multigroup spectrum from foils activity measurements [7, 8] and have been included for many years in ASTM standards [3]. These inversion methods combine information from activity measurements of foils with their respective response functions (cross sections and covariances) to provide a best-estimate multigroup spectrum. According to the selected method, one should provide an optional prior spectrum as input. An adjustment library CALMAR has been developed and some aspects of the library has already been exposed [4], this paper focusses on the public release of the library. Then it describes examples of use of the *ECORCES* code for nuclear data preparation and *CALMAR* code for the adjustment procedure.

Availability at NEA Data bank The publication process of CALMAR library is in progress at NEA databank and will be available soon. The library is written in C++ and linked to the ROOT framework [2]. The library is released as a source package under the open source CeciLL-C software license [1]. Open-source release makes technical exchanges easier for the dosimetry community.

Nuclear data processing - ECORCES The ECORCES code is a dedicated tool to extract nuclear data from IRDFF [10]. This code processes the dosimetry library in several ways to compute:

- Effective cross sections in an user energy grid, with an optional weighting flux
- Uncertainties (including covariances matrices) in an user grid
- Cumulated reactions rates with associated uncertainties

It has also basic graphing functions. ECORCES code has limitations : only cross section and activation files (files 3/10 in ENDF formalism [5]) and associated covariances (files 33/40) can be processed, and not resonance parameters. Example of use will be provided.

Adjustement procedure - CALMAR The use of *CALMAR* code follows a classical scheme:

- nuclear data preparation
- prior spectrum extraction from Monte-Carlo transport code for example.
- prior spectrum covariance estimation.
- extraction of measurements ("experimental reaction rates") : results from activation code or analytical solution.
- creating the job file
- running adjustment procedure
- getting results : integral values (integral flux, fast flux , displacements per atom) with uncertainties

All these steps will be applied to a dedicated example showing all the ways for launching the code (standalone, C++ scripting, library call). The numerical results obtained with CALMAR will be compared to other codes (STAYS'L, SAND-II,..), a first step to a new benchmark of adjustement procedures [6, 9].

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- [1] CeCILL-C open source license. http://www.cecill.info/licences/Licence_CeCILL-C_V1-en.txt.
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