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Date: May 24, 2007
To: Distribution
From: OTSUKA Naohiko
Subject: Definition of spectrum averaged cross section

All entries in the transmission K002 (K2021, K2022, K2023, K2024, K2025) give cross sections averaged over Bremsstrahlung spectrum (BRA). So far no definition of BRA is given in LEXFOR. In K002, all data with BRA are defined as follows:

Bremsstrahlung Spectrum Average: Modifier BRA

$$\sigma_{\text{BRA}}(E_{\text{max}}) = \frac{\int_0^{E_{\text{max}}} n(E, E_{\text{max}}) \sigma(E) dE}{\int_0^{E_{\text{max}}} (E / E_{\text{max}}) n(E, E_{\text{max}}) dE} \quad \text{with } n = \int_0^{E_{\text{max}}} n(E, E_{\text{max}}) dE,$$

where $n(E, E_{\text{max}})$ is Bremsstrahlung spectrum distribution normalized to the total number of photon n . The denominator is the definition of total number of “equivalent quanta”, which is the total energy divided by the maximum energy. This cross section is often given in the unit of [barn/equivalent quantum].

I would like to know my usage (definition) of BRA is consistent with that in other centres.

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