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Unfolding of energies of fusion products from the nuclear activation data at JET[1] JAN MLYNAR, Institute of Plasma Physics AS CR, Za Slovankou 3, Prague 8, 182 00 Czech Republic, G. BONHEURE, ERM, Brussels, Belgium, O. FICKER, FNSPE CTU Prague, Czech Republic, K. BAUER, FMP, Charles University, Prague 8, Czech Republic, S. POPOVICHEV, CCFE, Abingdon, United Kingdom, A. MURARI, Consorzio RFX, Padova, Italy, JET EFDA CONTRIBUTORS COLLABORATION — Diagnostics of fusion products, in particular of energetic charged particles, is a challenging task that requires further development. In this respect, activation probes were tested in JET, TEXTOR and ASDEX-U tokamaks as a novel and robust diagnostics, compatible with harsh conditions in future fusion reactors. The activation probe consists of a set of pure, well-characterized materials in which measureable amounts of radioisotopes are produced from nuclear reactions due to energetic particles. The production of each radioisotope can be modelled by an energy dependent yield curve derived from the specific nuclear reaction cross section data. In this contribution, the JET activation probe data will be reviewed with focus on possible spectral reconstruction of the incident fusion particles. A method will be outlined to reliably unfold neutron and proton energies, based on Tikhonov regularisation. First results of the neutron and proton energy spectra unfolded from the activation data will be presented. Although the analyses of the proton data are more complex due to several geometrical factors, the initial results demonstrate the potential of this robust diagnostic method, provided that the ill-conditioned task of unfolding is carefully implemented.

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