

1973a

“Anomalous Enhancements in Multiple-Pion Production with Deuterons,” T. Risser and M. D. Shuster, *Physics Letters*, Vol. 43B, No. 1, January 8, 1973, pp. 68–72.

The ABC Effect, a threshold bump seen in the isospin-zero channels of the reactions $NN \rightarrow d + \text{Missing Mass}$ and $pd \rightarrow \text{He}^3 + \text{Missing Mass}$, had been misunderstood for more than a dozen years in 1973 and was thought by some to reflect the presence of a new elementary particle, although many characteristics of the observed ABC bumps were inconsistent with this hypothesis. We showed that the ABC Effect was due to the excitation of two intermediate $\Delta(1240)$ resonances in the reaction which “beat” at certain energies and transfer momenta, because the bound nuclear wave function in the final state could not absorb large momentum transfers. This earliest analysis used a very simple model treating the particles as scalar and the deuteron wave function as a delta-function in momentum space. The salient characteristics of the ABC Effect were produced. This research was enlivened by the activities of another group which knew of my earliest (but also flawed) ideas on the origin of the ABC Effect and were rushing to perform simulations and publish my earlier ideas before me. They weren’t smart enough, and I was able to publish first. This other group published a string of papers consisting of this earlier flawed model and impossible simulation results without giving any external credit. These simulation results of the “competing” group were later exposed publicly as irreproducible by another worker in this field (see 1975a). This article continues to be cited frequently.

Superseded by 1975a