Single-Energy fits of MAID2015a pseudodata

I did several single energy fits with the MAID2015a pseudodata with different constraints and starting values. In all cases I just fitted the 4 observables: $d\sigma/d\Omega$, Σ, T and F. For these observables we already have experimental data. This set is not complete and we might expect ambiguities.

1. Unconstrained fit with MAID2015a starting values
In this fit up to H-waves ($\ell = 6$) 40 parameters were fitted. Fig. 1 shows the results for the s-,-p, and d-waves. The lines show the MAID15a ("true") solution. The starting parameters of the fit were randomly selected in a 50% range relative to the "true" solution.

2. Unconstrained fit with BnGa starting values
Here, the same fit was repeated. Only the starting parameters of the fit were randomly selected in a 50% range relative to a BnGa solution. Fig. 2 shows the results. The solid lines show the BnGa solution (starting values) the dashed lines the MAID2015a ("true") solution.

3. Fits using the exact helicity amplitudes as constraint
Figs. 3 to 5 show fits of MAID2015a pseudo-data with MAID2015a, BnGa and η-MAID2003 as starting values. Here, the squared deviation between the fitted and the MAID2015a helicity amplitudes averaged over the angular distribution was added as a penalty factor in the χ^2 with weighting factor $Q = 1$.

4. Fits using Hedims helicity amplitudes as constraint
As last step, I replaced the exact helictiy amplitudes by the results from Hedim's fixed-t analysis (Helcon-SE.dat). Figs. refFig:const4 to 8 show the results with starting values from MAID2015a, BnGa, and $\eta - MAID2003$.

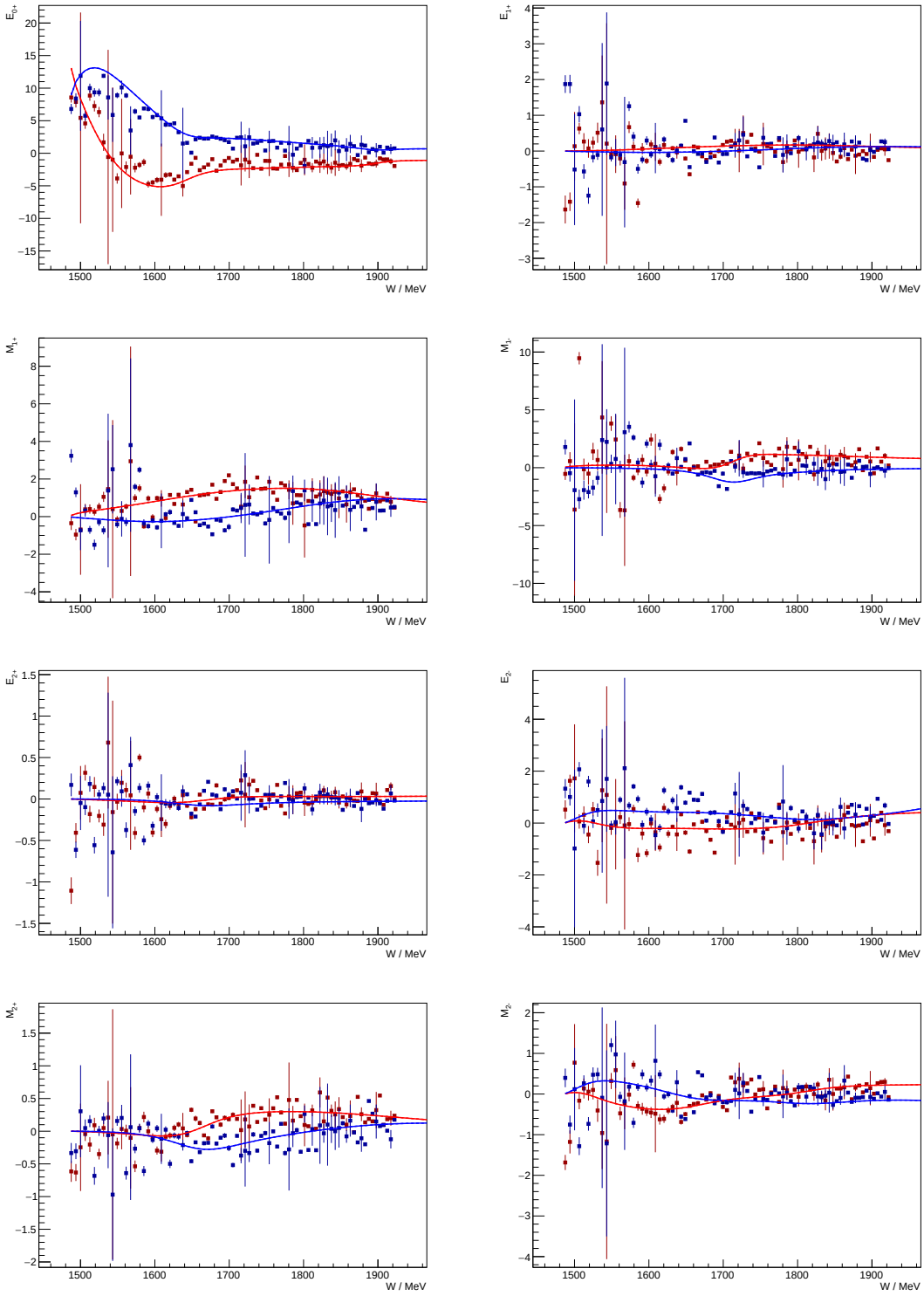

Figure 1: s-, p- and d-wave multipoles from an unconstrained fit. Red: Real-Part; Blue Im-Part. The lines show the MAID15a ("true") solution. The starting parameters of the fit were randomly selected in a 50% range relative to these "true" values.

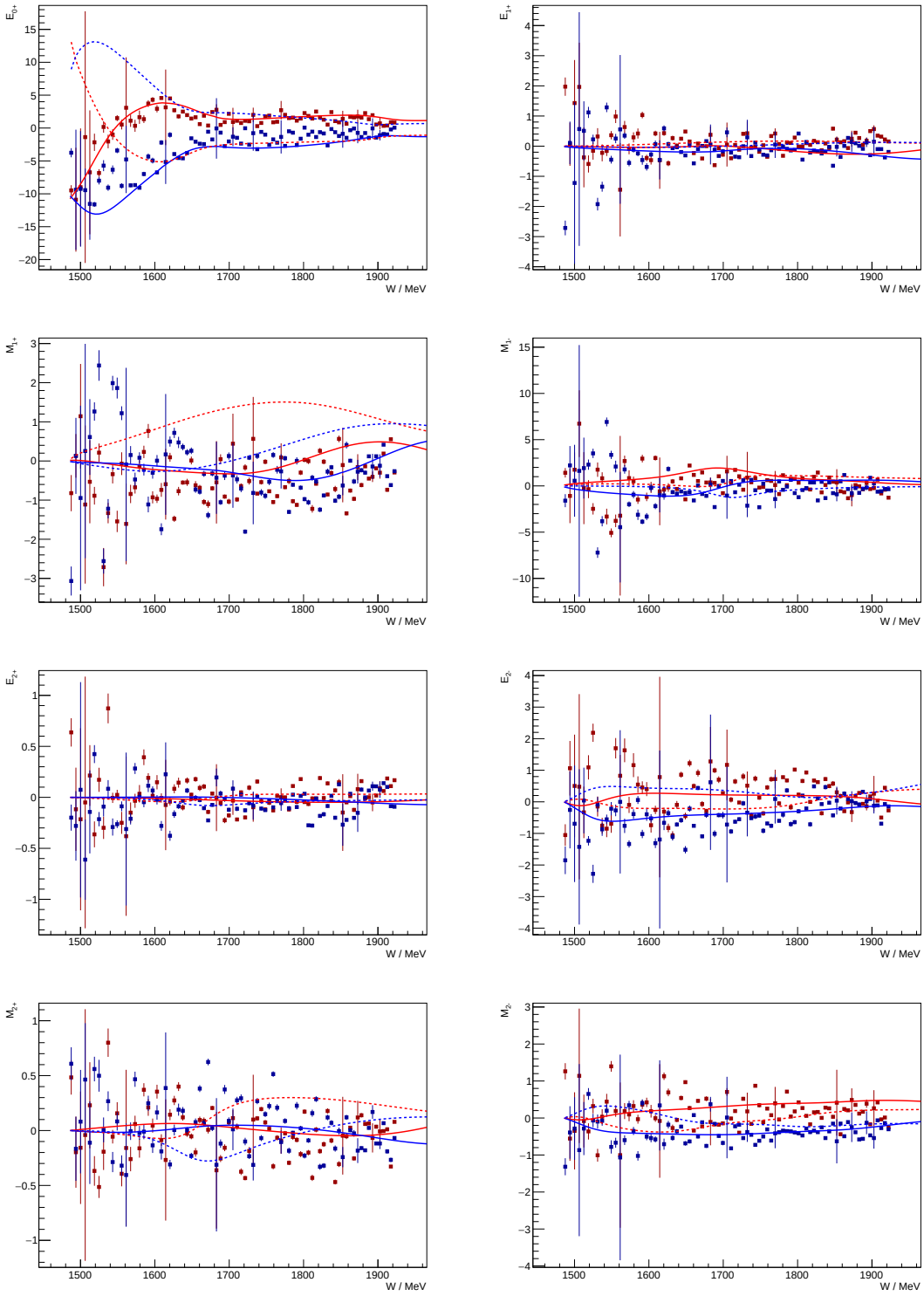

Figure 2: Same as in Fig. 1. However, the starting parameters of the fit were randomly selected in a 50% range relative to the BnGa solution (solid lines). The dashed lines show the "true" MAID2015a curves.

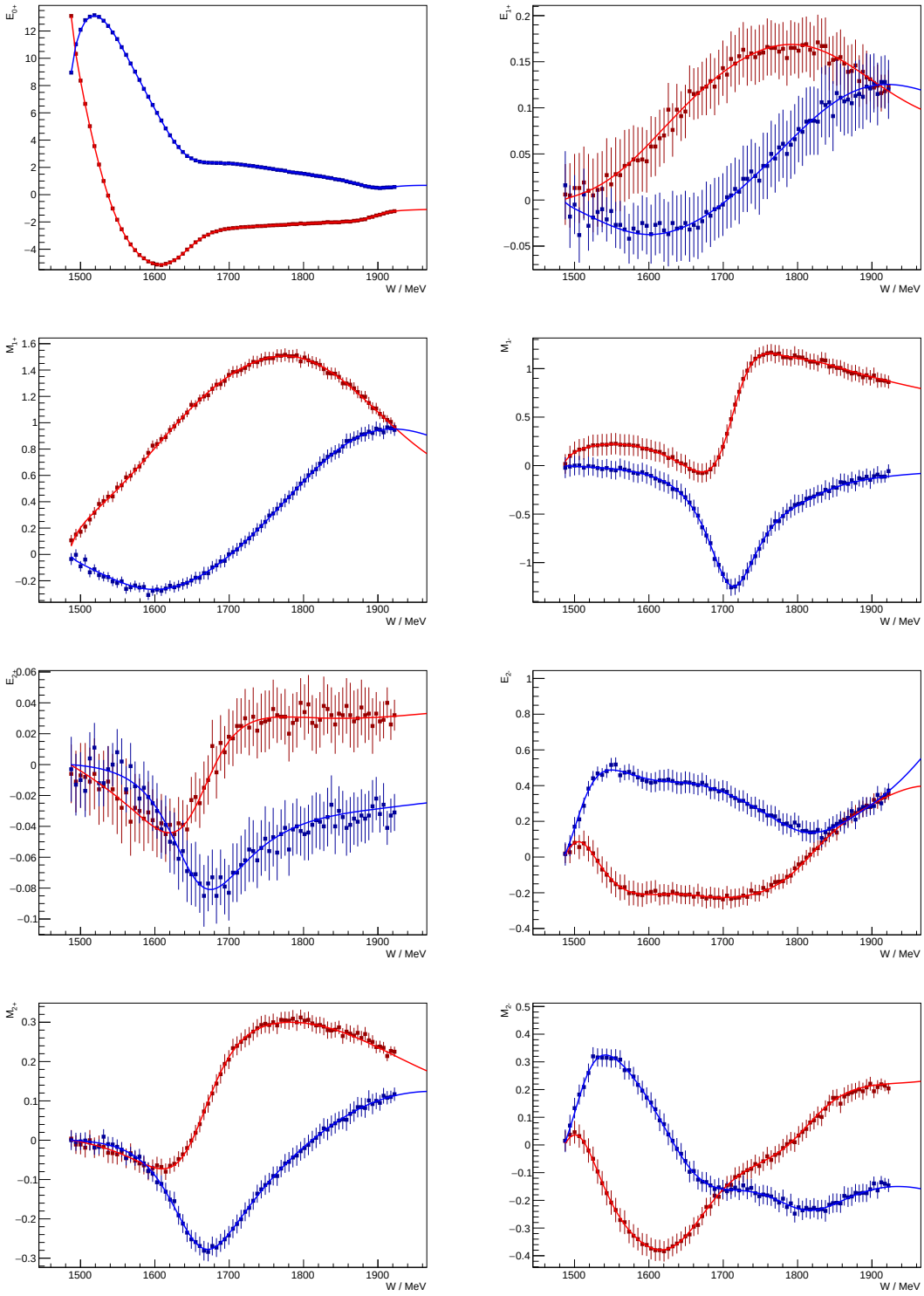

Figure 3: s-, p- and d-wave multipoles from a fit constrained to the "true" MAID2015a helicity amplitudes. Starting values: 50% range around the MAID15a solution.

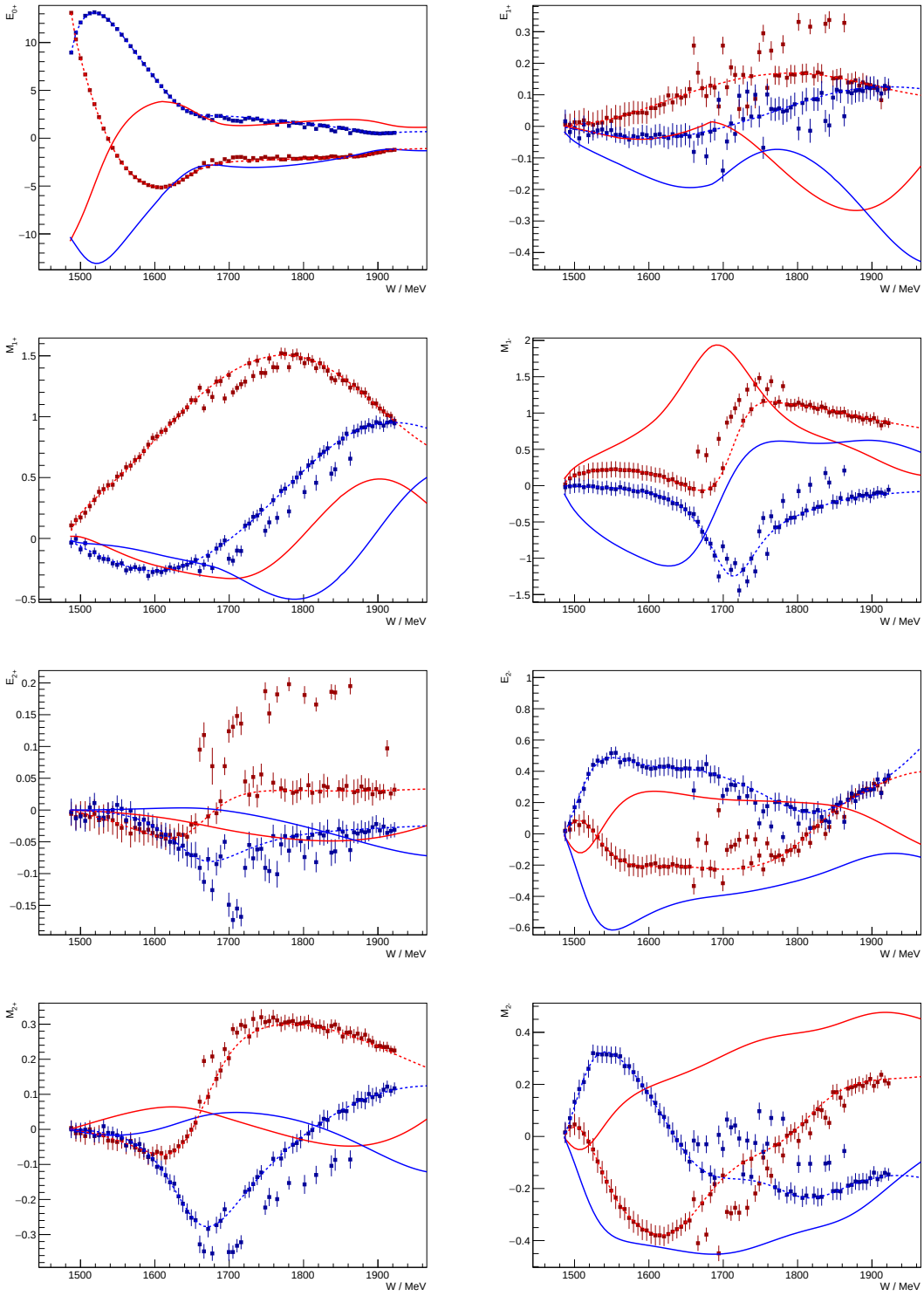

Figure 4: s-, p- and d-wave multipoles from a fit constrained to the "true" MAID2015a helicity amplitudes. Starting values: 50% range around the BnGa solution (solid line). The "true" MAID2015a curves are shown by the dashed lines.

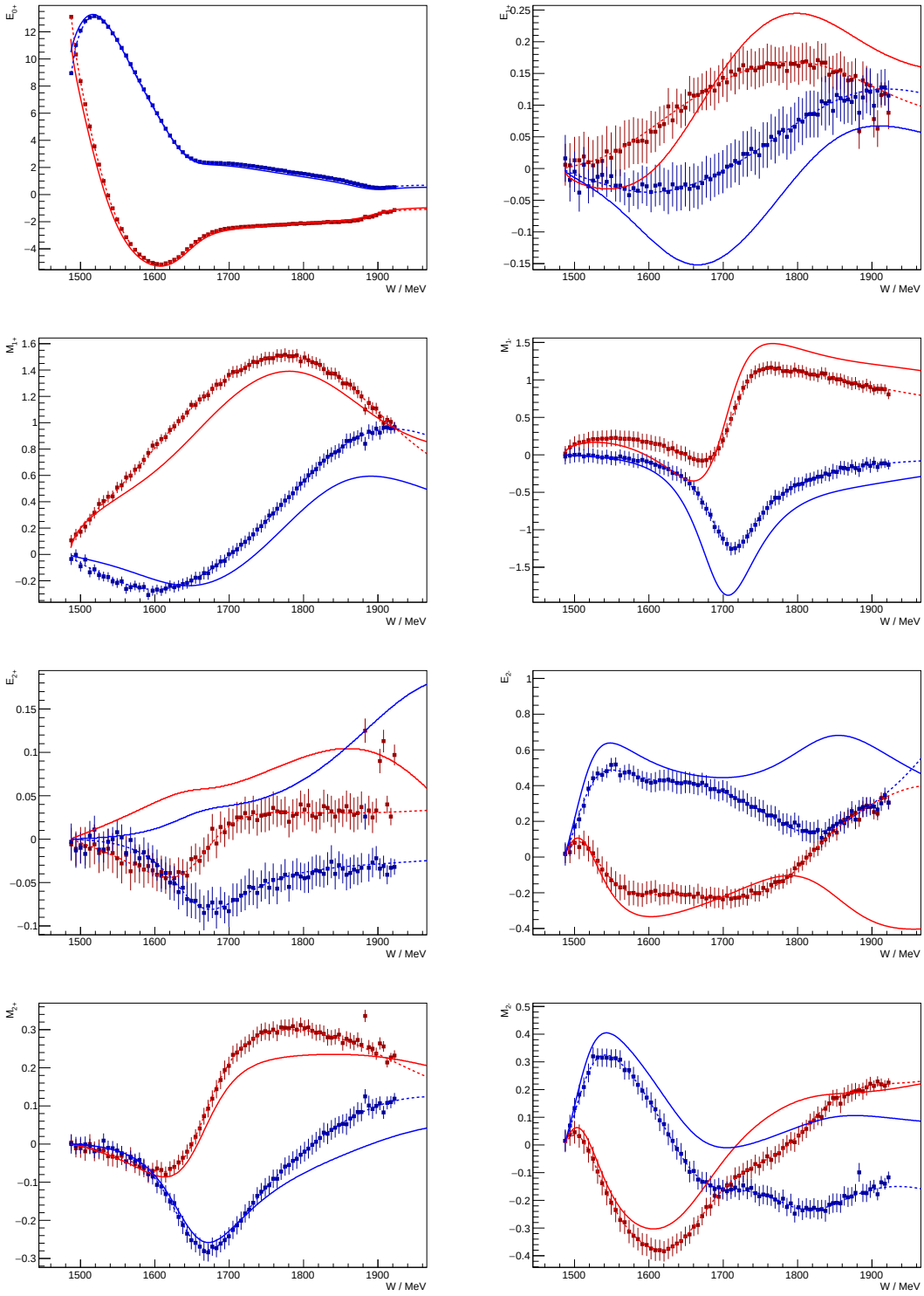

Figure 5: s-, p- and d-wave multipoles from a fit constrained to the "true" MAID2015a helicity amplitudes. Starting values: 50% range around the η-MAID2003 solution (solid line). The "true" MAID2015a curves are shown by the dashed lines.

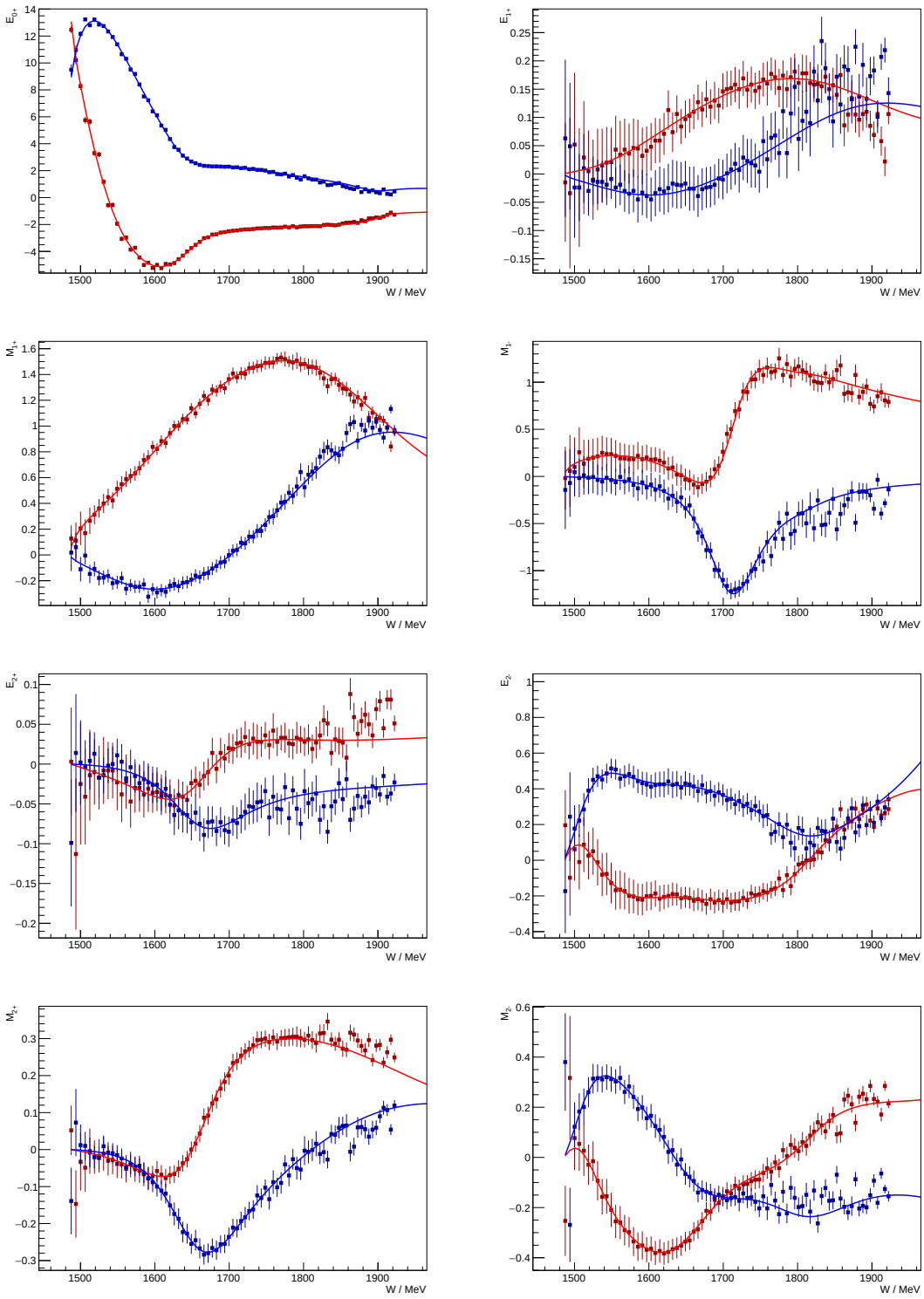

Figure 6: s-, p- and d-wave multipoles from a fit constrained to the Hedims amplitudes. Starting values: 50% range around the MAID15a solution.

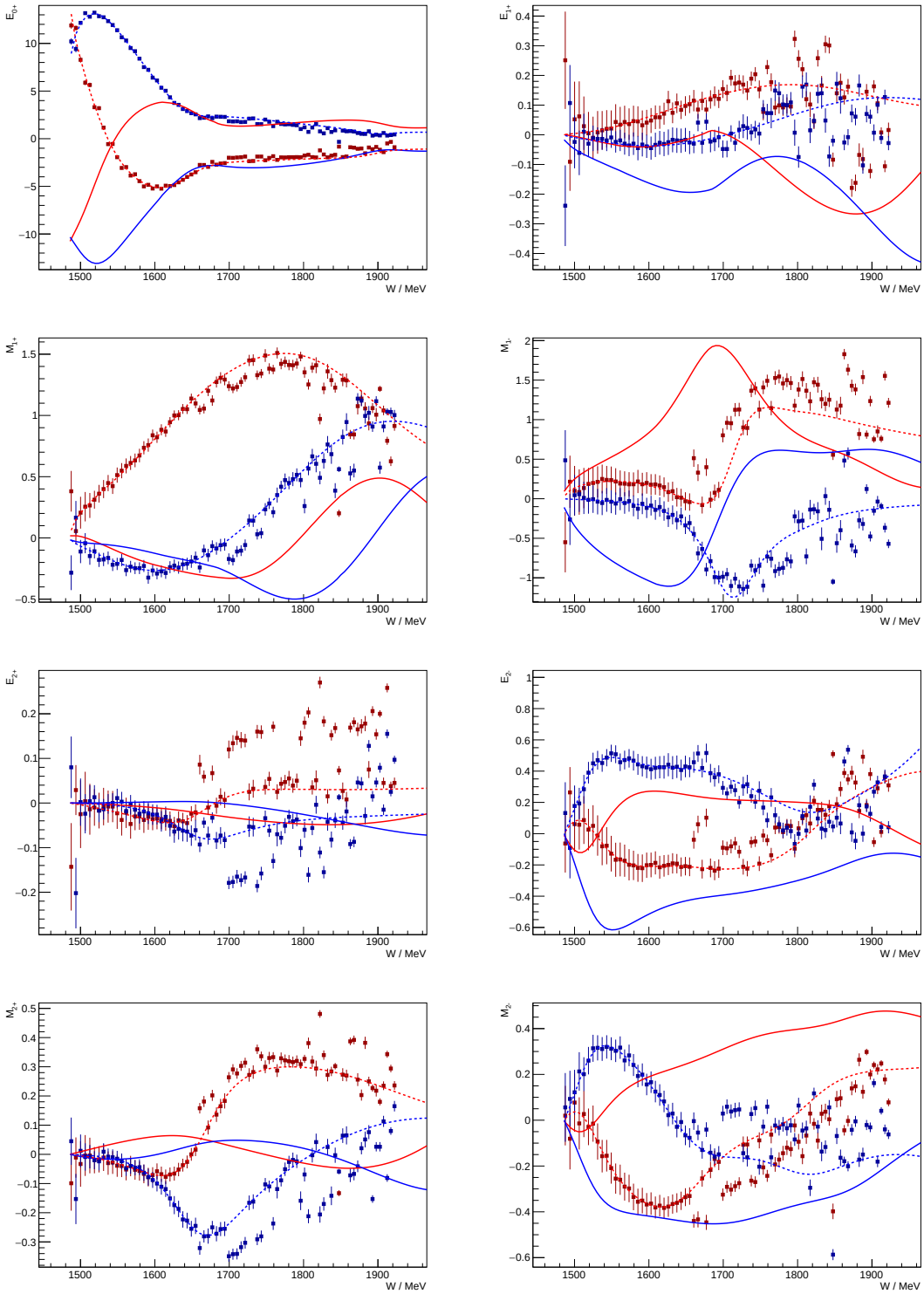

Figure 7: s-, p- and d-wave multipoles from a fit constrained to the Hedims amplitudes. Starting values: 50% range around the BnGa solution (solid). "True" MAID2015a: dashed.

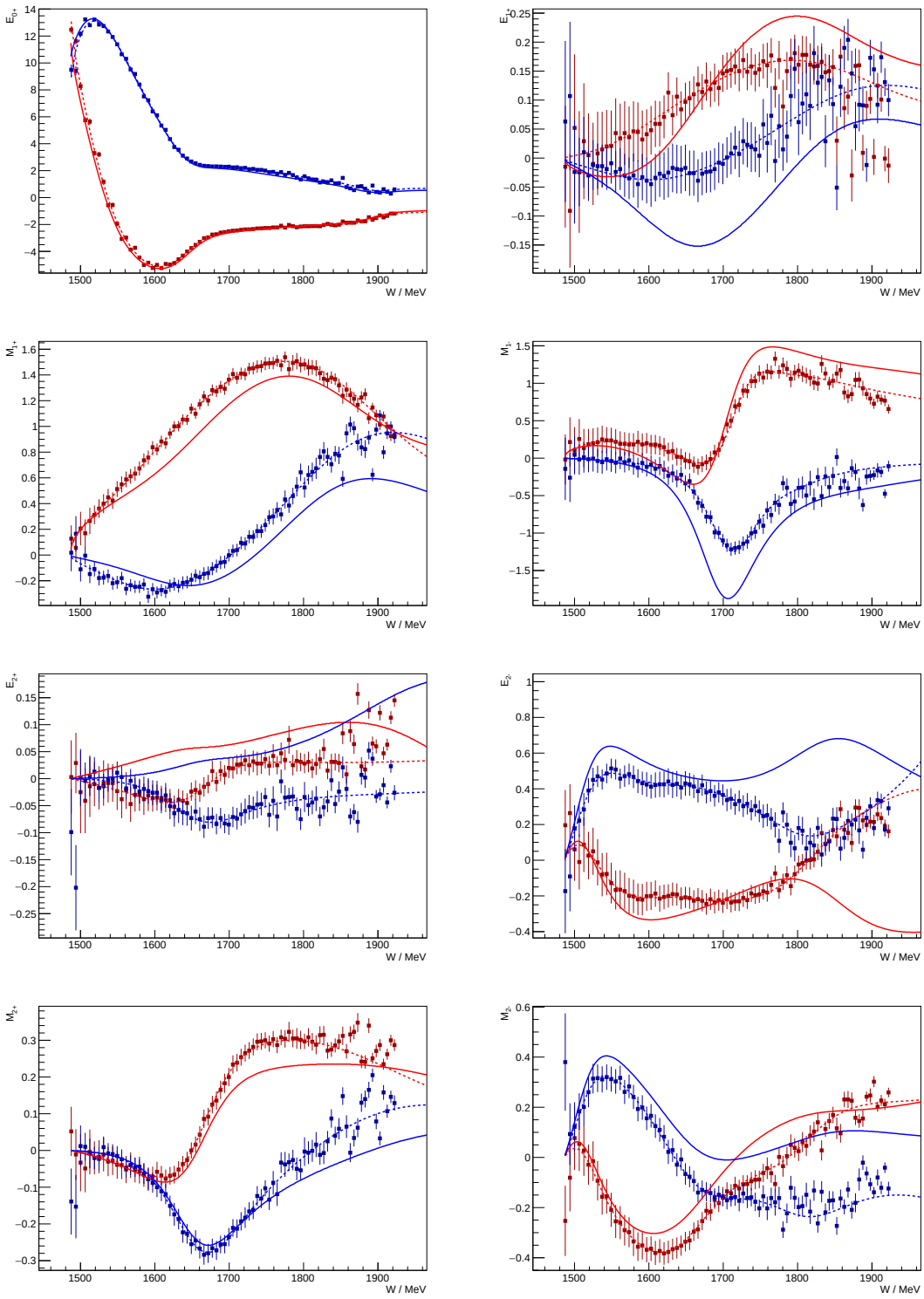

Figure 8: s-, p- and d-wave multipoles from a fit constrained to the Hedims amplitudes. Starting values: 50% range around the η-MAID2003 solution (solid). "True" MAID2015a: dashed.