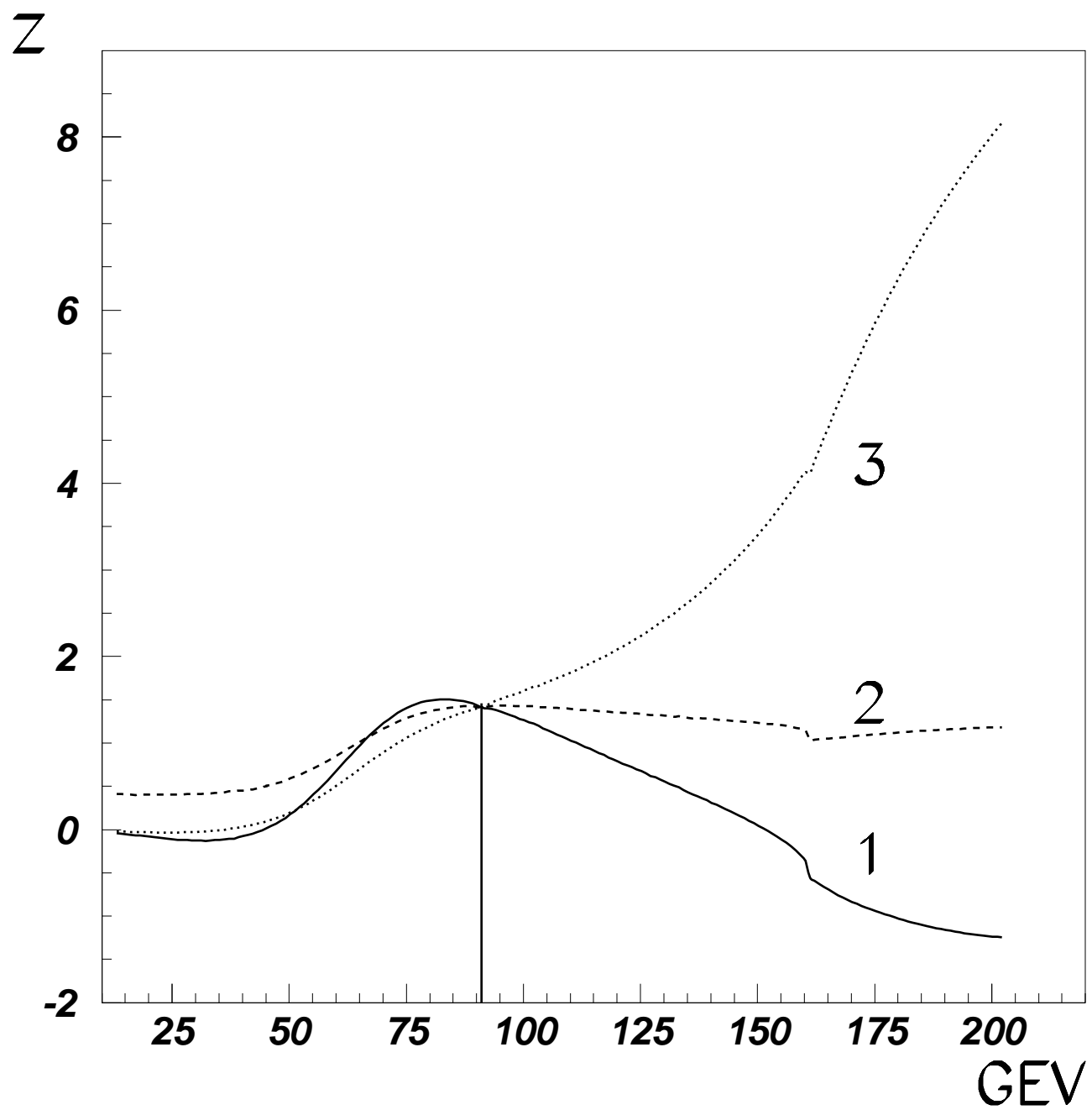
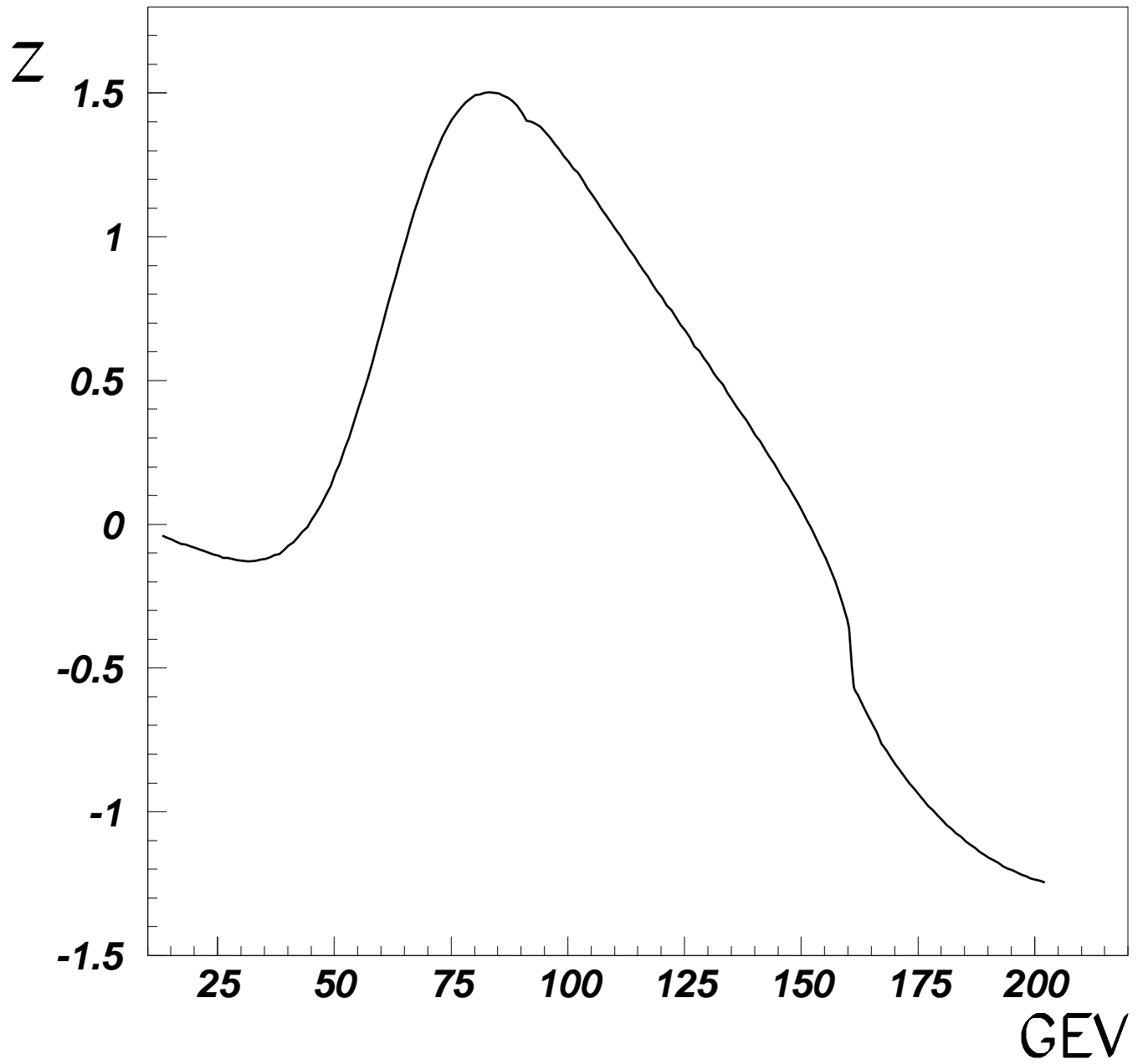


- THE OFF-RESONANCE CONTRIBUTIONS FROM $V^{AB,NAB}(s)$ and $B^{WW}(s)$ ARE VANISHINGLY SMALL AT LEP1 ENERGIES
- HOWEVER, THEY ARE VERY IMPORTANT BEYOND RESONANCE, IN PARTICULAR AT LEP2
- TO PRESERVE GAUGE CANCELLATION IT IS NECESSARY TO ADD BOX CONTRIBUTION





$$R = \frac{\sigma_{e\bar{e} \rightarrow d\bar{d}}^{IBA} - \sigma_{e\bar{e} \rightarrow b\bar{b}}^{IBA}}{\sigma_{e\bar{e} \rightarrow d\bar{d}}^{IBA}}, \%$$

DOUBLE DECONVOLUTED \rightarrow

- NO ISR QED
 - NO FSR QED \times QCD
-

$\sigma_{e\bar{e} \rightarrow d\bar{d}}^{IBA} \rightarrow$ UNIVERSAL

$\sigma_{e\bar{e} \rightarrow b\bar{b}}^{IBA} \rightarrow$ UNIVERSAL + NON-UNIVERSAL

$$\left| \begin{array}{l} V(s) + B(s, t) \\ \hline \end{array} \right.$$

$$A = \frac{1}{s - M_z^2 + iM_z\Gamma_z} \left[V^{Zbb}(s) + (s - M_z^2) \left(\frac{V^{\gamma bb}(s)}{s} + B^{WW}(s, t) \right) \right]$$

$$\begin{aligned} V &= V_0 + V_t \\ B &= B_0 + B_t \end{aligned}$$