Comparison with CDF and CMS

Comparison with results obtained by the CDF and CMS collaborations are shown in Figs. 17 and 18 for the HX and CS frames, respectively. The results by the CMS collaboration [33] are obtained in pp collision at $\sqrt{s} = 7 \text{ TeV}$ for the rapidity regions $|y^\Upsilon| < 0.6$ and $0.6 < |y^\Upsilon| < 1.2$. The results by the CDF collaboration [31] are obtained in pp collision at $\sqrt{s} = 1.96 \text{ TeV}$ for the rapidity region $|y^\Upsilon| < 0.6$. There is good agreement with CMS results for both frames, and with CDF for the CS frame.

Figure 17: The values of (top) $\lambda_\theta$, (middle) $\lambda_{\theta\phi}$ and (bottom) $\lambda_\phi$ parameters, measured in the HX frame for (left) $\Upsilon(1S)$, (center) $\Upsilon(2S)$ and (right) $\Upsilon(3S)$ mesons. Results of this analysis for the rapidity region $2.2 < y^\Upsilon < 4.5$ are shown with red solid circles and blue solid squares for data collected in pp collisions at $\sqrt{s} = 7$ and 8 TeV, respectively. The results by the CMS collaboration [33] obtained in pp collision at $\sqrt{s} = 7 \text{ TeV}$ for rapidity regions $|y^\Upsilon| < 0.6$ and $0.6 < |y^\Upsilon| < 1.2$ are shown with magenta open upward triangles and cyan open downward triangles, respectively. The results obtained by the CDF collaboration [31] in pp collision at $\sqrt{s} = 1.96 \text{ TeV}$ for rapidity region $|y^\Upsilon| < 0.6$ are shown with green open diamonds. Some data points are displaced from the bin centers to improve visibility. The error bars indicate the sum of the statistical and systematic uncertainties added in quadrature.