The effect of the shower quality cut on the $\eta\pi\pi$ final states

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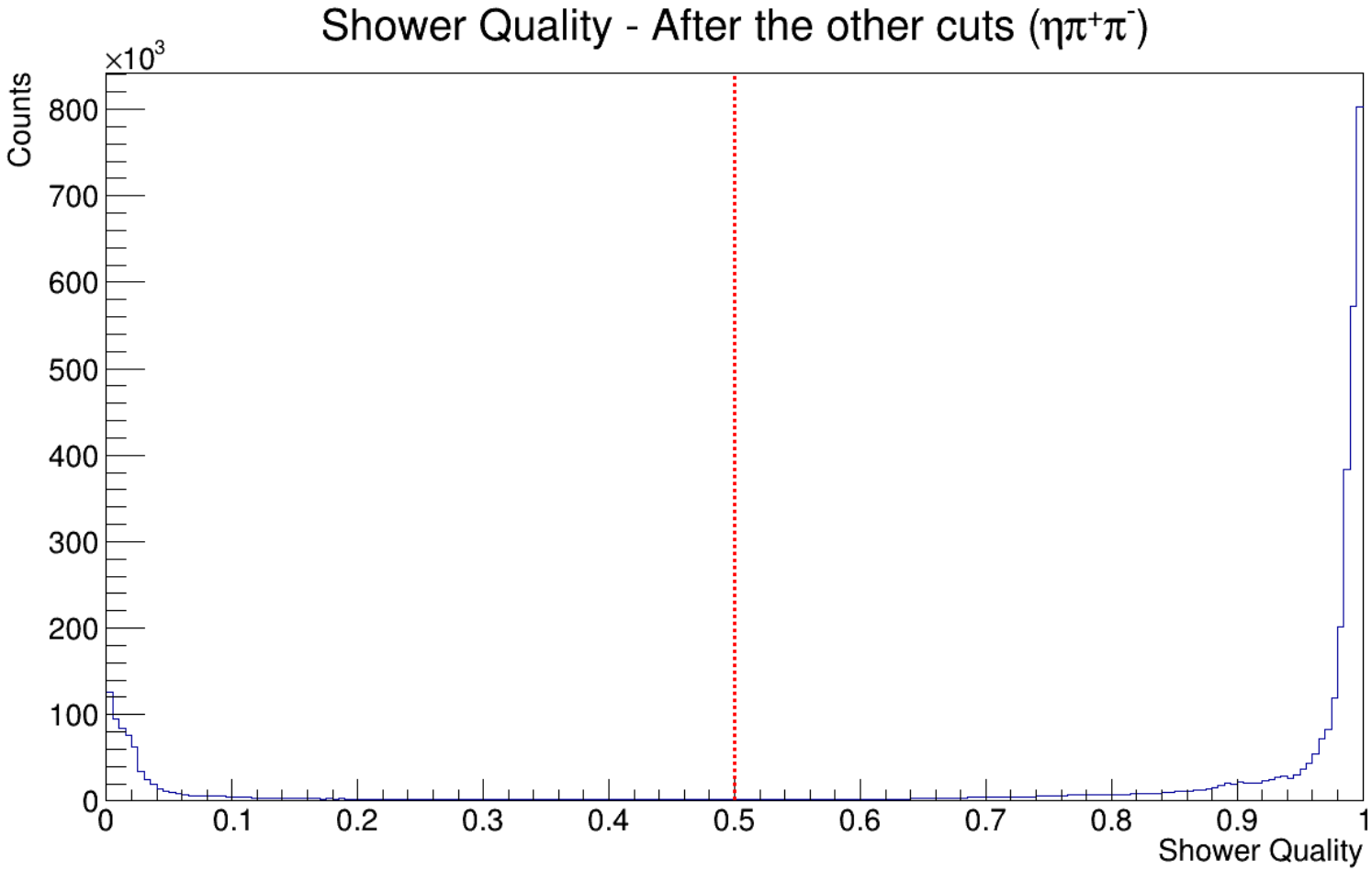
In this document:

- Plot the shower quality histogram for both final states
- Apply a shower quality cut of 0.5
- Plot the $\eta\pi\pi$ mass for the events that **failed** the shower quality cut
- Plot the $\eta\pi\pi$ mass for the events that passed all the cuts, including the shower quality cut, and compare it with the mass plot that we get if the shower quality cut is not included in the cut flow

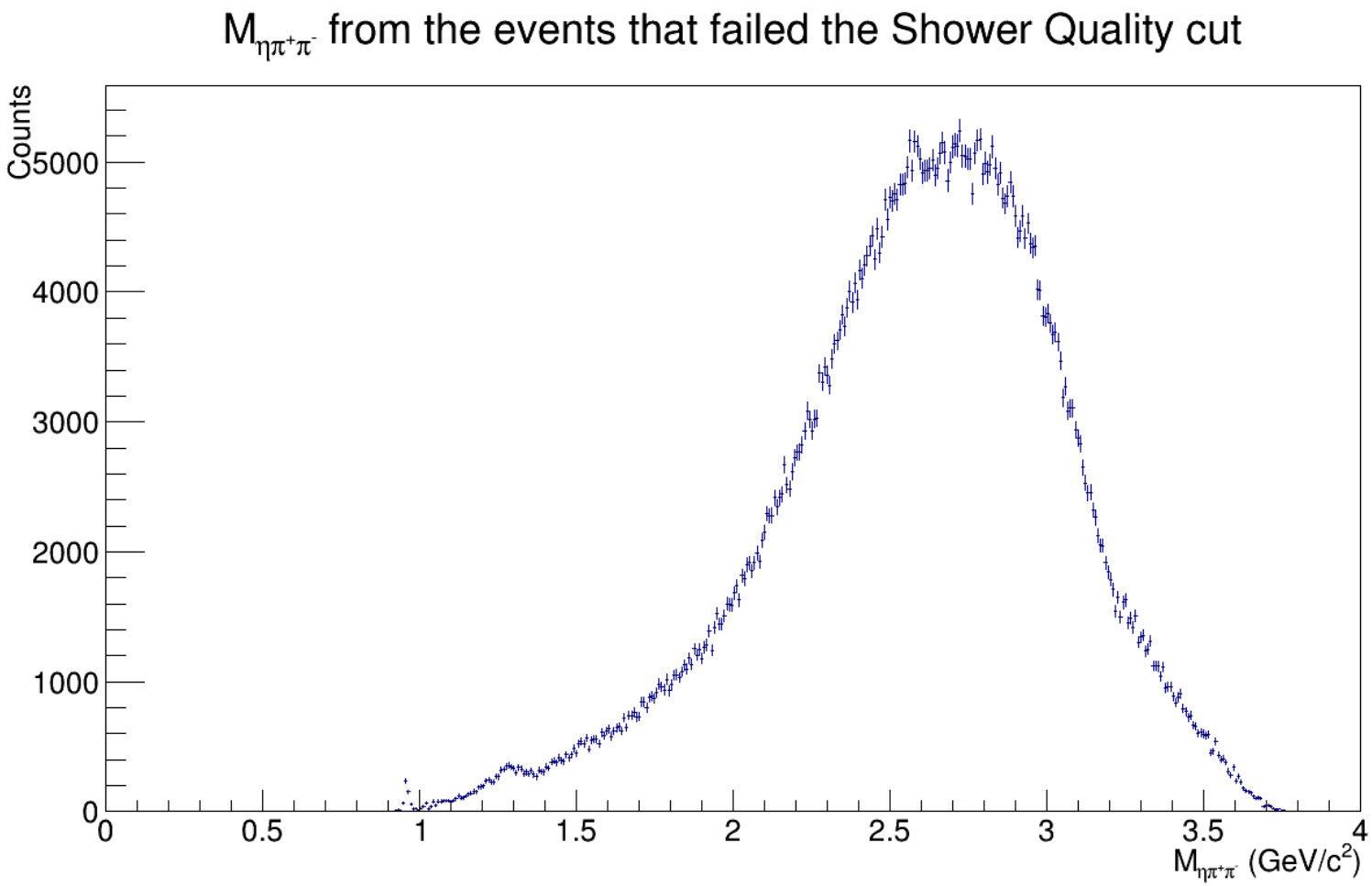
The $\eta\pi^+\pi^-$ final state

The shower quality for the $\eta\pi^+\pi^-$ final state



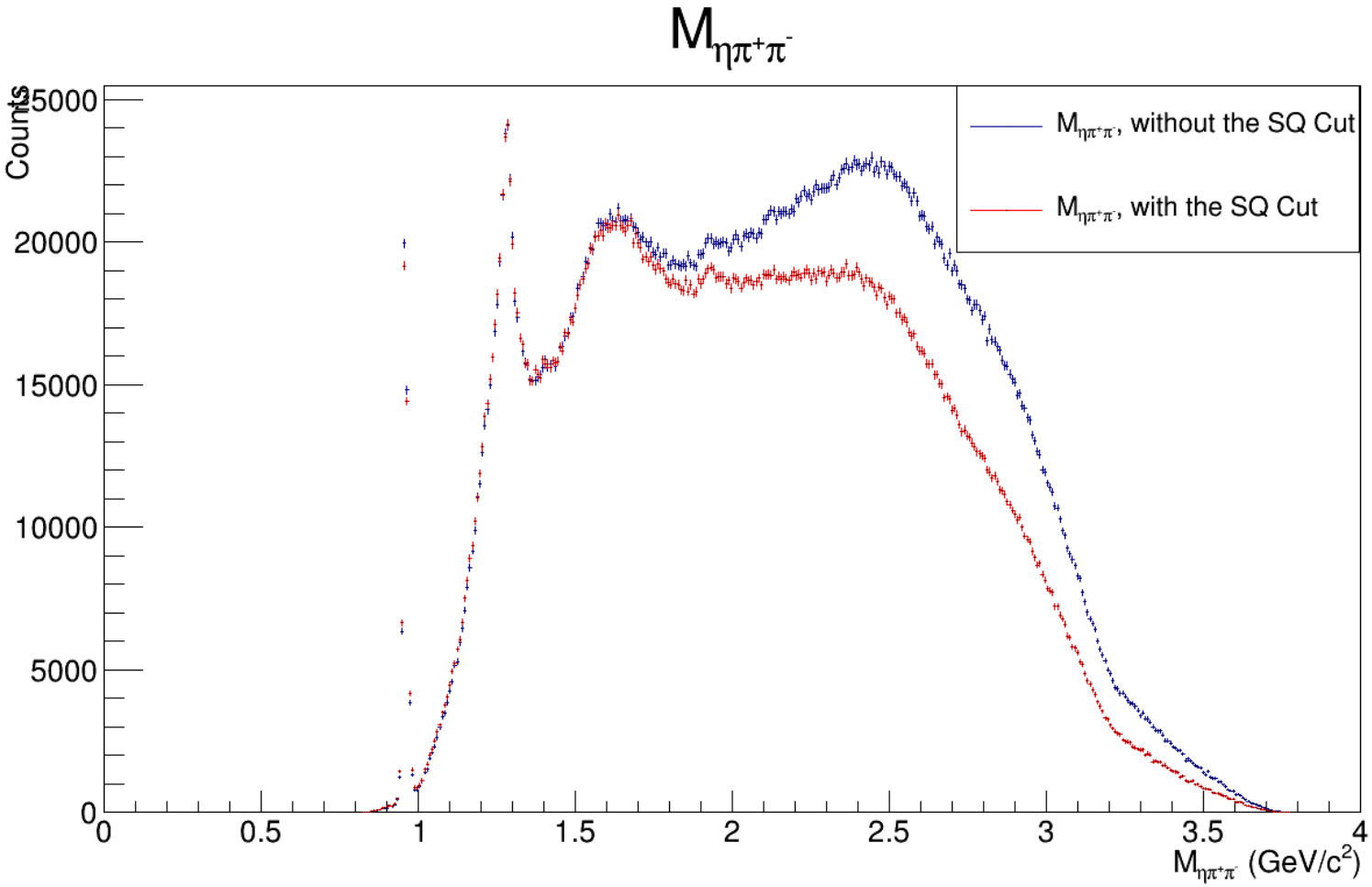
- The red dashed line shows the position of the cut

The $\eta\pi^+\pi^-$ mass for the events that failed the Shower Quality cut



- There is almost no η'/f_1 signal in the rejected events

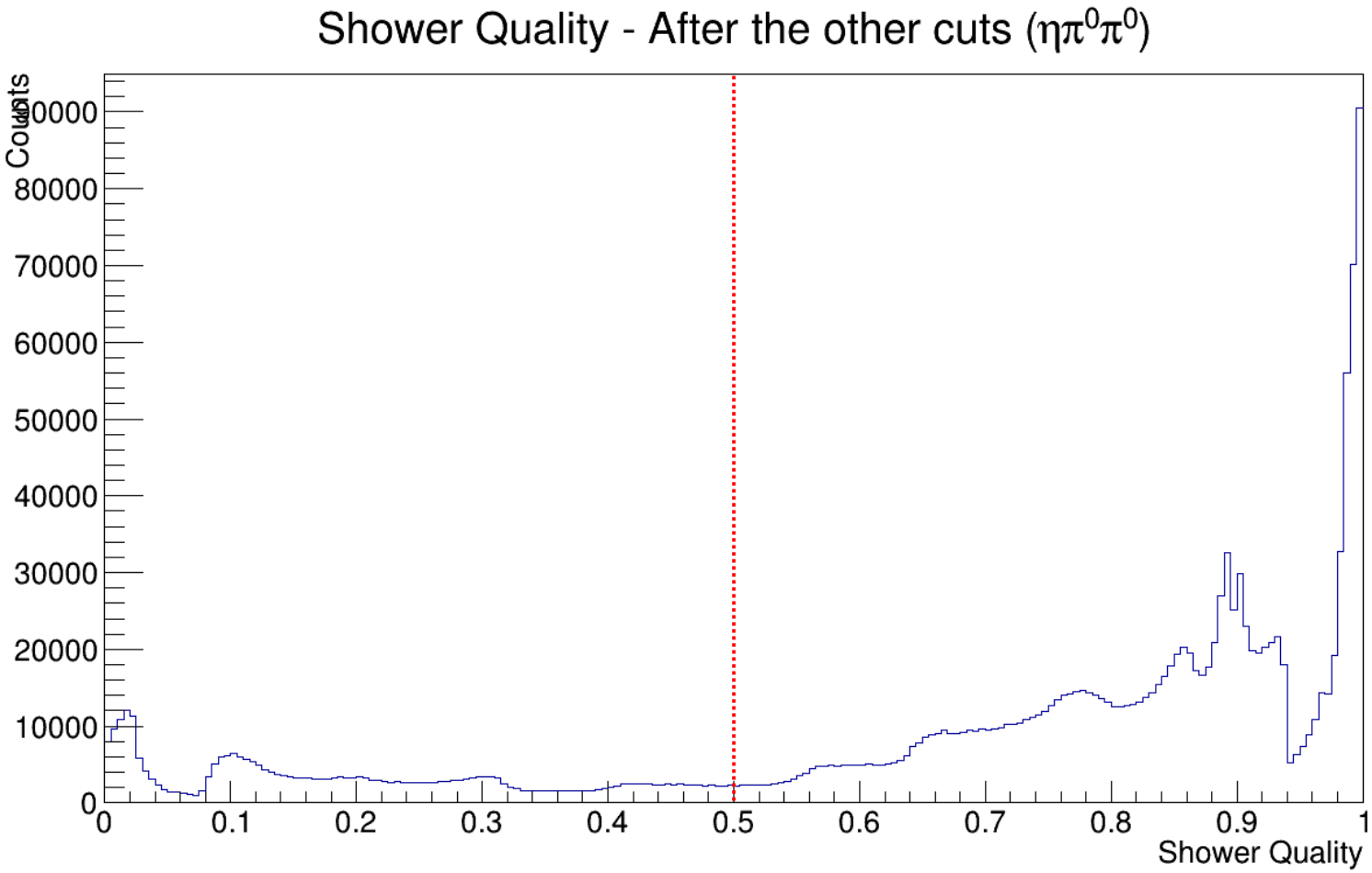
The $\eta\pi^+\pi^-$ mass with/without the Shower Quality cut



- The SQ cut is very efficient for removing part of the high-mass background

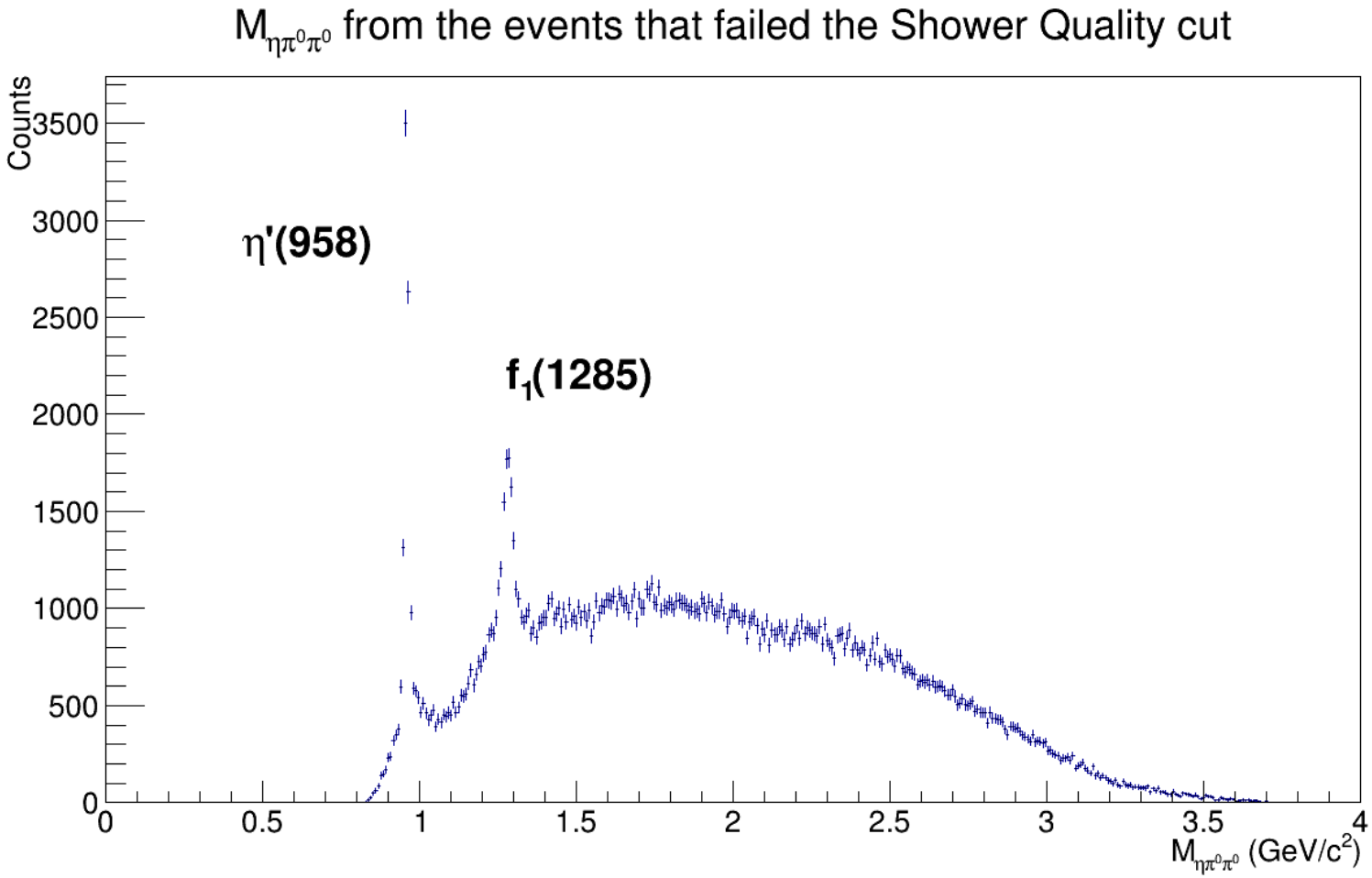
The $\eta\pi^0\pi^0$ final state

The shower quality for the $\eta\pi^0\pi^0$ final state



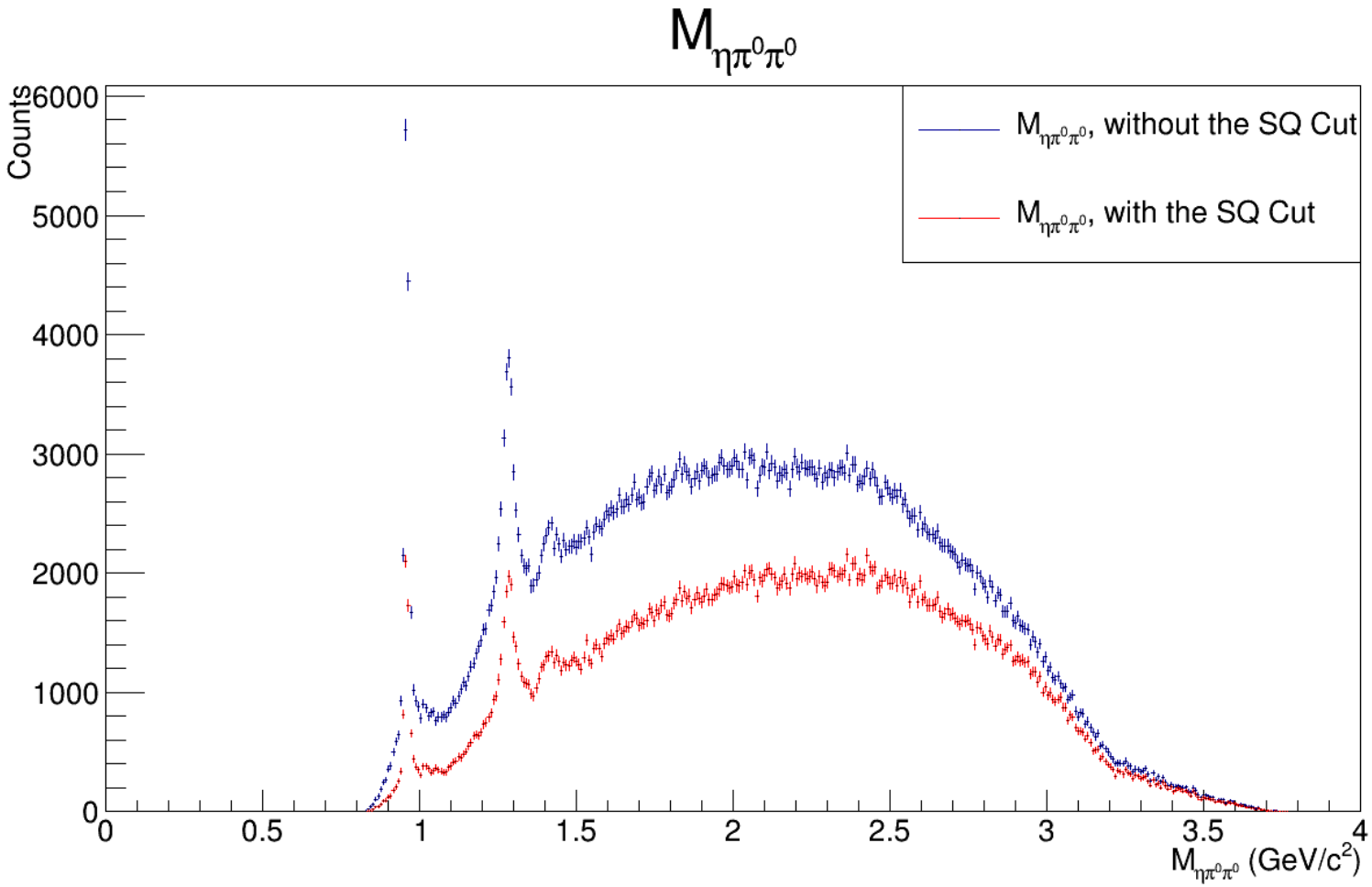
- The red dashed line shows the position of the cut

The $\eta\pi^0\pi^0$ mass from the events that failed the Shower Quality cut



- There is strong presence of η'/f_1 signal in the rejected events

The $\eta\pi^0\pi^0$ mass with/without the Shower Quality cut



- The SQ cut for the 6γ final state removes more than 1/3 of the yield