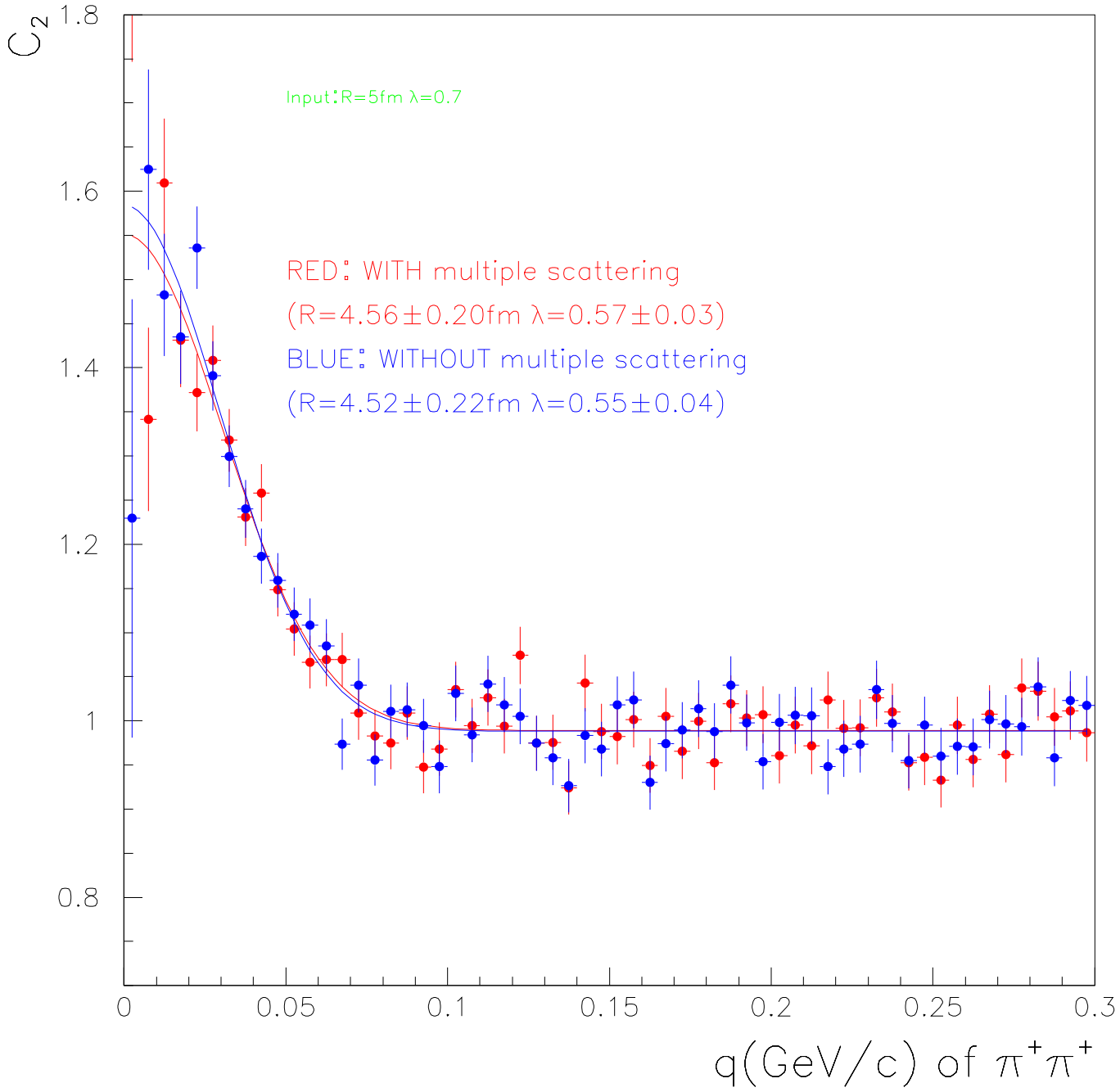Effects of 2 particle separation cut−off