

# Linearly Polarized Gluons in $J/\psi$ and $\Upsilon$ Production

## Abstract

It has been recently pointed out that gluons can be linearly polarized even inside an unpolarized hadron provided that gluons should have non-zero transverse momentum with respect to the parent hadron. The effect of linearly polarized gluons on transverse momentum ( $P_T$ ) and rapidity ( $y$ ) distributions of  $J/\psi$  and  $\Upsilon$  production is studied within the framework of transverse momentum dependent (TMD) factorization employing color evaporation model (CEM) in unpolarized proton proton collision. The estimated  $P_T$  and  $y$  distributions of  $J/\psi$  and  $\Upsilon$  have been modulated by the presence of linearly polarized gluons inside unpolarized proton at LHCb, RHIC and AFTER energies. Therefore, quarkonium production is a handy process to extract the unknown density function of linearly polarized gluons.