

The CMS detector discovery potential for resonant production of the massive Kaluza - Klein excitations predicted by the Randall-Sundrum model is studied. Full simulation and reconstruction are used to study the diphoton decay of Randall-Sundrum gravitons. For an integrated luminosity of  $30 \text{ fb}^{-1}$ , the diphoton decay of Randall-Sundrum gravitons can be discovered at the  $5\sigma$  level for masses up to  $1.61 \text{ TeV}/c^2$  for the case of weak coupling between graviton excitations and Standard model particles ( $c = 0.01$ ). Heavier resonances can be detected if the coupling is larger ( $c = 0.1$ ), with a mass reach of  $3.95 \text{ TeV}/c^2$ .