$m(t_1) - m(\tilde{\chi}_1^0) = m_t$.

The R parity violating decays considered in this analysis are $T1qqqqL$ (Fig. 3a) and $T1tbs$ (Fig. 3b). In $T1qqqqL$, the gluino decays to the lightest squark ($\tilde{g} \rightarrow \tilde{q} q$), which in turn decays to a quark ($\tilde{q} \rightarrow q \tilde{\chi}_1^0$), but decays with the $\tilde{\chi}_1^0$ off shell (violating R parity) into two quarks and a charged lepton, giving rise to a prompt 5-body decay of the gluino. In $T1tbs$, each gluino decays into three different SM quarks (a top, a bottom, and a strange quark).

![Diagrams](image1.png)

Figure 1: Diagrams illustrating the simplified RPC SUSY models with gluino production considered in this analysis.

![Diagrams](image2.png)

Figure 2: Diagrams illustrating the simplified RPC SUSY models with squark production considered in this analysis.

### 3 The CMS detector and event reconstruction

The central feature of the CMS detector is a superconducting solenoid of 6 m internal diameter, providing a magnetic field of 3.8 T. Within the solenoid volume are a silicon pixel and strip tracker, a lead tungstate crystal electromagnetic calorimeter (ECAL), and a brass and scintillator hadron calorimeter (HCAL), each composed of a barrel and two endcap sections. Forward calorimeters extend the pseudorapidity ($\eta$) coverage provided by the barrel and endcap detectors. Muons are detected in gas-ionization chambers embedded in the steel flux-return yoke.