Let $\gamma_t(G)$ denote the total domination number of the graph $G$. $G$ is said to be total domination edge critical, or simply $\gamma_t$-critical, if $\gamma_t(G + e) < \gamma_t(G)$ for each edge $e \in E(G)$. The diameter of 4-critical graphs is either 2, 3 or 4. In a previous paper we characterized structurally the 4-critical graphs with diameter four. In this paper we study the 4-critical graphs with diameter two.

Keywords: Total domination, edge-critical, diameter, edge addition.