

## Saturation Number and Saturation Spectrum of Brooms

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Given two graphs  $G$  and  $H$ , the graph  $G$  is  $H$ -saturated if  $H$  is not a subgraph of  $G$  but the addition of any edge from  $\overline{G}$  to  $G$  results in a copy of  $H$ . The minimum size of an  $H$ -saturated graph on  $n$  vertices is denoted  $\text{sat}(n, H)$ . A broom,  $B_{s,t}$  is a tree on  $s + t$  vertices formed by identifying the end vertex of a path on  $s$  vertices with the center vertex of a  $K_{1,t}$ . We determine  $\text{sat}(n, B_{s,t})$  for all brooms such that  $t \geq 3$ .

The saturation spectrum for a graph  $H$ , denoted  $\text{spec}(n, H)$ , is the set of sizes of  $H$ -saturated graphs between  $\text{sat}(n, H)$  and  $\text{ex}(n, H)$ . We prove that  $\text{spec}(n, B_{s,t})$  contains every integer from  $\text{sat}(n, B_{s,t})$  to within a constant of  $\text{ex}(n, B_{s,t})$ . Additionally, we determine completely the saturation spectrum for a number of small brooms.

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