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Graphs associated with the map $x \mapsto x+x^{-1}$ in finite fields of characteristic two

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In this paper we study the structure of the graphs associated with the iterations of the map $x \mapsto x+x^{-1}$ over finite fields of characteristic two. Formulas are given for the length of the cycles and the depth of the trees relying upon the structure of the group of the rational points of Koblitz curves and the congruences of Kloosterman sums modulo powers of 2.

Comments: 17 pages; one example added; minor adjustments

Subjects: **Number Theory (math.NT)**; Dynamical Systems (math.DS)

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