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LINEAR-TIME ALGORITHMS FOR SCATTERING NUMBER AND HAMILTON-CONNECTIVITY OF INTERVAL GRAPHS

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We prove that for all $k \leq -1$ an interval graph is $-(k+1)$ -Hamilton-connected if and only if its scattering number is at most k . This complements a previously known fact that an interval graph has a nonnegative scattering number if and only if it contains a Hamilton cycle, as well as a characterization of interval graphs with positive scattering numbers in terms of the minimum size of a path cover. We also give an $O(n+m)$ time algorithm for computing the scattering number of an interval graph with n vertices and m edges, which improves the previously best-known $O(n^3)$ time bound for solving this problem. As a consequence of our two results, the maximum k for which an interval graph is k -Hamilton-connected can be computed in $O(n+m)$ time.