Eigenvalues of minimal Cantor systems

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In this article we give necessary and sufficient conditions for a complex number to be a continuous eigenvalue of a minimal Cantor system. Similarly, for minimal Cantor systems of finite rank, we provide necessary and sufficient conditions for having a measure-theoretical eigenvalue. These conditions are established from the combinatorial information on the Bratteli?Vershik representations of such systems. As an application, from any minimal Cantor system, we construct a strong orbit equivalent system without irrational continuous eigenvalues which shares all measure-theoretical eigenvalues with the original system. In a second application a minimal Cantor system is constructed satisfying the so-called maximal continuous eigenvalue group property.