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28804-8511. *Channel assignment on Cayley graphs.*

A common problem in communication networks is *channel assignment*, the assignment of frequencies to transmitters in a given network in such a fashion that transmitters which are close to one another are given frequencies sufficiently different to ensure non-interference of the transmitters' signals. A network can be modeled by a graph in which the graph's vertices represent the transmitters and the path metric on the graph can be used to measure proximity of the transmitters to one another.

We discuss various channel assignment problems on the Cayley graphs of certain groups, applying elementary group theoretic techniques to compute the frequency span of certain Cayley graphs. In particular, we show that if G is the Cayley graph of an n -generated group Γ with a certain kind of presentation, then $\lambda(G; k, 1) = 2(k + n - 1)$. For some values of k this is the obvious optimal value for any $2n$ -regular graph. A large number of groups (for instance, even Artin groups and a number of Baumslag-Solitar groups) satisfy this condition. We indicate some conjectures concerning the Cayley graphs corresponding to generic group presentations. (Received January 21, 2010)