1038-05-158 **Zoltan Furedi*** (z-furedi@math.uiuc.edu), Depertment of Mathematics, University of Illinois at Urbana-Champaign, 1409 W Green Street, Urbana, IL 61801. *Complete H-decompositions.*

Let H be a simple graph. An *H-packing of order n* is a set $\mathcal{P} := \{H_1, H_2, \ldots, H_m\}$ of edge disjoint copies of H whose union forms a graph with n vertices. If this graph is the *complete graph* K_n, then $\mathcal{P}$ is called a *perfect* H-packing on n vertices, or following the terminology of the design theory, it is called an *H-design* of order n. The case $H = K_k$ is equivalent to the existence of Steiner systems $S(n, k, 2)$.

Let $f(n; H)$ be the smallest integer t such that, any H-packing on n vertices can be extended to a perfect H-packing on at most $n + t$ vertices. The existence of $f(n; H)$ follows from a far more general result of Wilson 1972–1975.

There are many explicit constructions to provide linear upper bounds $f(n, H) < c_H n$ by Hoffman, Lindner, Rodger, and Stinson, by Jenkins, by Küçükçifçi, Lindner, and Rodger. Bryant, Khodkar, and El-Zanati gave explicit upper bounds (linear in n) for an infinite class of bipartite H.

Here we give an asymptotic that $f(n, C_4) = (1 + o(1))\sqrt{n}$. Most of this talk is based on work with Hilton, Lehel and Lindner. (Received February 06, 2008)