

# Equivalence of Random Intersection Graph and $G(n, p)$ for $\alpha \leq 6$ .

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In  $G(n, m, p)$  model to each vertex  $v$  from the vertex set  $V$  ( $|V| = n$ ) we assign a set of its features  $D_v$  by choosing independently each feature with probability  $p$  from the feature set  $W$  ( $|W| = m = n^\alpha$  for some constant  $\alpha$ ). Then we connect the vertices  $v, v' \in V$  by an edge if and only if sets  $D_v$  and  $D_{v'}$  intersect. While introducing a new random graph model, the natural question is, whether it is equivalent to previously studied ones. In particular, what are the similarities between the newly studied model and the classical model  $G(n, \hat{p})$ , where  $\hat{p}$  is an edge probability in the new model. In the case of  $G(n, m, p)$  this question was posed and answered for  $\alpha > 6$  by A. Fill, E. R. Scheinerman and K. B. Singer–Cohen. In their work they conjectured that the equivalence theorem is also true for  $3 \leq \alpha \leq 6$ . In my talk I will discuss the conjecture and present results, which solve it in the case of the monotone properties. Moreover I will explain, why it is impossible to prove the equivalence theorem for  $3 \leq \alpha \leq 6$  in such general form as it was for  $\alpha > 6$ .