Monochromatic cycle cover in random graphs

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A classic result of Erdős, Gyárfás and Pyber states that if the edges of K_n are colored with a constant number of colors, then its vertex set can be covered by constantly many monochromatic cycles. We study this problem in the random graph $G(n,p)$ and prove the following. If for an integer r and probability $p \geq n^{-1/r+\epsilon}$, the edges of $G(n,p)$ are r-colored, then all the vertices can be covered by $O(r^{10})$ monochromatic cycles whp. On the other hand, if $p = o(n^{-1/r})$ then the number of monochromatic cycles needed to cover the vertices of $G(n,p)$ grows with n whp. Joint work with Frank Mousset, Rajko Nenadov, Nemanja Skoric and Benny Sudakov.