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Comparing open book and Heegaard decompositions of 3-manifolds

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Abstract: We study the maximal value of the Euler characteristic of the pages of all open book decompositions of closed orientable 3-manifolds. In particular, we describe some examples where the minimal genus Heegaard splittings of such 3-manifolds give rise to open book decompositions and other examples where the simplest open book decomposition has larger maximal Euler characteristic of pages than the smallest genus Heegaard splittings. Also, special properties of the Heegaard splitting associated to an open book decomposition are given. Techniques of minimal surface theory and hyperbolic geometry are shown to be useful for such problems.



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