THIN CIRCLE VALUED MORSE FUNCTIONS ON KNOTS IN S^3

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A circular Morse function on the the knot complement $E(K) = S^3 \setminus K$ is a function $f : E(K) \to S^1$ which is Morse. Such a function induces a handle decomposition on $E(K)$ with the property that every regular level surface contains a Seifert surface for the knot. In this work we will show that it is possible to rearrange the handles in such a way that the regular surfaces are as *simplest* as possible. To prove this we introduce a complexity for the regular level surfaces and the *circular width for E(K)*. We also analyze the behavior of the *circular width* under some knot operations.