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Complex surfaces with real analytic plurisubharmonic exhaustion function

This paper is a continuation of the earlier work of the authors, *Minimal kernels of a class of weakly complete spaces* (J. Funct. Anal. **210**(2004), 125–147). A minimal kernel (defined in that paper) of a weakly complete manifold was shown to be a union of a family of pairwise disjoint compact pseudoconcave sets. If the manifold X admits a real analytic exhaustion function and has complex dimension two, then either the kernel is empty (and X is Stein), or the kernel is the union of an isolated sequence of compact complex curves (and X can be obtained by blow-ups of a Stein space), or the kernel is equal to X , which has to be foliated (in a relaxed sense of the word) by compact complex curves and/or compact Levi flat hypersurfaces (with possible singularities). The details of this structure are most transparent when the exhaustion function has only isolated critical points. This is joint work with Giuseppe Tomassini.