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Relative Disk Envelopes

Let X be a complex manifold, Y be an open subset of X and let ϕ be an upper semicontunuous function on Y. Consider the space $H(X,Y)$ of all analytic disks in X whose boundaries lie in Y. On this space we introduce an equivalence relation: two analytic disks are equivalent if their centers coincide and they can be connected by a continuous curve in $H(X,Y)$. We show that on the set Y' of equivalence classes there is a local homeomorphism ρ into X that defines on Y' a structure of a complex manifold.

We define the relative disk envelope of ϕ on X as the infimum of the integrals of ϕ over the boundaries of all analytic disks in $H(X,Y)$ with centers at $z_0 \in X$ and boundaries in Y. As the result we get a function on Y' which is plurisubharmonic.

This approach immediately generates many geometric questions that will be also discussed.