An abstract concentration compactness lemma and applications to semilinear elliptic equations on various unbounded domains

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The standard technique of using Pierre-Louis Lions' concentration compactness Lemma is to first produce a critical sequence using functional analysis and then use the concentration compactness Lemma to either show the precompactness of the sequence or deduce the existence of a critical point. We will discuss an abstract concentration compactness lemma incorporated into the functional analysis which easily permits extending standard results on cylinders or wedges to various other unbounded domains.