1067-14-1116   **Mounir Nisse*** (`nisse@math.tamu.edu`), Department of Mathematics, Texas A&M University, College Station, TX 77843, and **Frank Sottile** (`sottile@math.tamu.edu`), Department of Mathematics Texas A&M University, College Station, TX 77843. *Complex and non-Archimedean Coamoebas.*

A complex amoeba (resp. coamoeba) is the image of a subvariety of a complex torus under the logarithmic (resp. argument) map. The behavior of amoebas at infinity is linked to the geometry of the Newton polytope, in the case of complex hypersurfaces. For amoebas of complex varieties of codimension greater than one, Bergman, Bieri, and Groves show a similar fact using the notion of logarithmic limit set. In this paper, we introduce a similar object, called the *phase limit set*, and we show a structure theorem for coamoebas of a complex algebraic varieties. More precisely, if V is an algebraic variety of dimension k in $(\mathbb{C}^*)^n$, with coamoeba $co\mathcal{A}$, and phase limit set $\mathcal{P}^\infty(V)$. Then the closure of $co\mathcal{A}$ in the universal covering of the real torus is equal to $co\mathcal{A} \cup \mathcal{P}^\infty(V)$. Moreover, $\mathcal{P}^\infty(V)$ is the union of an arrangement $\mathcal{H}(V)$ of k-torus and the coamoebas of some complex algebraic varieties of dimension l with $l \leq k-1$. Also, we introduce the notion of non-archimedean coamoebas, and we describe their structure in terms of complex coamoebas. (Received September 19, 2010)

1