1106-52-647 **Paxton M Turner*** (pturne7@tigers.lsu.edu), 5130 Highland Road Apt. C, Baton Rouge, LA 70808, and **Yuhuai Wu**, 98 Cambridge Cr, Fredericton, NB E3B4N9, Canada. *Discrete Equidecomposability and Period Collapse.* Preliminary report.

We present new results in two topics related to Ehrhart theory: equidecomposability and period collapse. First, we disprove a conjecture posed by both J. Kantor and T. McAllister that Ehrhart equivalence implies equidecomposablility. We do so by producing two Ehrhart-equivalent denominator 5 triangles and then developing an invariant to show that they are not equidecomposable. Surprisingly, there does exist an infinite equidecomposability relation between these two triangles if we delete an edge. Also, we provide necessary and sufficient conditions for equidecomposability in terms of a family of graphs associated to minimal triangulations of a given polygon. In the other direction, we give an explicit formula for the Ehrhart quasi-polynomial in terms of the interior and boundary points up to certain dilates of a polygon. Next, we observe a general linear recurrence relation for the coefficients of the Ehrhart series and give a geometric interpretation for this relation. Under some assumptions, we can do this geometric construction for denominator D triangles with period collapse $k|D$, which converts the period collapse problem into studying half-open rational parallelograms whose discrete and continuous areas are the same. We close with some related conjectures and problems. (Received September 04, 2014)