The local Gan-Gross-Prasad conjectures (Bessel case) give a precise description of some branching-laws between orthogonal or unitary groups over local fields in terms of some arithmetic invariants. In this talk, I shall mainly focus on the case of unitary groups. The simplest form of the conjecture is as follows. Let E/F be a quadratic extension of local fields, V a finite dimensional hermitian space over E and W a nondegenerate hyperplane of V. Set $G = U(W) \times U(V)$ and $H = U(W)$. We may view H as a subgroup of G via the diagonal embedding. For π a smooth irreducible representation of $G(F)$, denote by $m(\pi)$ the space of $H(F)$-invariant linear forms on π (with the further requirement that we only consider continuous linear forms in the archimedean case). By multiplicity one theorems of Aizenbud-Gourevitch-Rallis-Schiffmann and Jiang-Sun-Zhu, we know that $m(\pi)$ is always less or equal to one. The Gan-Gross-Prasad conjecture predicts that this result continue to hold if we replace π by a tempered L-packet. Namely, if Π is such an L-packet then

$$\sum_{\pi \in \Pi} m(\pi) \leqslant 1$$

Moreover, this should become an equality if we replace Π by the corresponding extended Vogan L-packet (restricted to the pure inner forms of G that are "relevant"). A more precise version of the conjecture even pins down the unique representation π in the extended L-packet having multiplicity one. This refinement involves certain local root numbers associated to the Langlands parameter of π. In a pioneering work, Waldspurger and Moeglin-Waldspurger have proved the conjecture and its refinement for orthogonal groups over p-adic fields. In this talk, I shall present a proof of the conjecture for unitary groups which has the advantage of working equally well over any local field of characteristic 0. If time permits, I will also discuss further development implying the refined conjecture (this is work in progress).