Let $F$ be a number field, and $\mathbb{A} = \mathbb{A}_F$. In this paper, first, we provide a family of global Arthur parameters confirming all parts of a general conjecture on the relation between the structure of Fourier coefficients and the structure of global Arthur parameters, given by Jiang in 2012. Then we extend a correspondence between certain automorphic forms on $Sp_{4n}(\mathbb{A})$ and $\tilde{Sp}_{4n\pm2n}(\mathbb{A})$, given by Ginzburg, Jiang and Soudry in 2012, to certain automorphic forms on $Sp_{4mn}(\mathbb{A})$ and $\tilde{Sp}_{4mn\pm2n}(\mathbb{A})$, using the same idea of considering compositions of automorphic descent maps. (Received August 11, 2013)