1135-15-2205 **Zhuoheng He** (jzl0073@auburn.edu), 221 Parker Hall, Auburn University, Auburn, AL 36849, **Jianzhen Liu*** (jzl0073@auburn.edu), 221 Parker Hall, Auburn University, Auburn, AL 36849, and **Tin-Yau Tam**, 221 Parker Hall, Auburn University, Auburn, AL 36849. *The general ϕ-Hermitian solution to mixed pairs of quaternion matrix Sylvester equations.*

Let $\mathbb{H}^{m\times n}$ be the space of $m\times n$ matrices over $\mathbb{H}$, where $\mathbb{H}$ is the real quaternion algebra. Let A_ϕ be the $n\times m$ matrix obtained by applying ϕ entrywise to the transposed matrix A^T, where $A\in\mathbb{H}^{m\times n}$ and ϕ is a nonstandard involution of $\mathbb{H}$. We first give some properties of the Moore-Penrose inverse of the quaternion matrix A_ϕ. Then we consider two systems of mixed pairs of quaternion matrix Sylvester equations $A_1X-YB_1=C_1,\ A_2Z-YB_2=C_2$ and $A_1X-YB_1=C_1,\ A_2Y-ZB_2=C_2$, where Z is conditions for the existence of a solution (X,Y,Z) to those systems in terms of the ranks and Moore-Penrose inverses of the given coefficient matrices will be presented. Moreover, the general solutions to these systems are explicitly given when they are solvable. (Received September 26, 2017)