3D Joint Kinetics Data Processing and Analysis – Thomas Young

The ankle moment curve for walking in the sagittal-plane starts in at zero and becomes a plantarflexion moment at about 20% of stance. The ankle moment curve for walking then comes back from being plantarflexed to come close to zero again at the end of the stance phase. This can be validated by the negative results of the AnkImp_X metric since the area of the ankle moment curve is primarily below zero. In contrast, the ankle power curve for walking in the sagittal-plane starts at zero and becomes slightly negative at the midstance. The ankle power curve for walking then becomes very positive before coming back down to zero at the end of the stance phase. This can also be validated by the positive results of the AnkWork_X metric since the area of the power curve is slightly above zero.

The ankle moment curve for running in the sagittal-plane starts in at zero and becomes plantarflexed at the midstance. The ankle moment curve for running then comes back from being plantarflexed to come back to zero at the end of the stance phase. This can be validated by the negative results of the AnkImp_X metric since the area of the ankle moment curve is primarily below zero. In contrast, the ankle power curve for walking in the sagittal-plane starts at zero and becomes slightly negative at the midstance. The ankle power curve for running then becomes very positive before coming back down back to zero at the end of the stance phase. This can also be validated by the positive results of the AnkWork_X metric since the area of the power curve is slightly above zero.

The knee moment curve for walking in the sagittal-plane starts in a slightly flexed position and becomes very flexed before coming back to a zero at the midstance. The knee moment curve for walking then becomes extended before coming close zero at the end of the stance phase. In contrast, the knee power curve for walking in the sagittal-plane starts slightly positive and moves close to zero at the midstance. The knee power curve for walking then becomes negative before coming back to near zero at the end of the stance phase.

The knee moment curve for running in the sagittal-plane starts in a slightly flexed position and becomes very flexed before coming back to zero at the midstance. The knee moment curve for running then becomes extended before coming close to zero at the end of the stance phase. In contrast, the knee power curve for running in the sagittal-plane starts slightly positive and becomes very negative before coming back to zero at the midstance. The knee power curve for walking then becomes very positive before coming back down to zero at the end of the stance phase.

The hip angle curve for walking in the sagittal-plane starts in a flexed position and becomes less flexed at the midstance. The hip angle curve for walking then comes close to neutral before being slightly flexed at the end of the stance phase. The hip moment curve for walking in the sagittal-plane starts around zero and becomes very extended at the midstance. The hip moment curve for walking then becomes slightly flexed at end of the stance phase. The hip power curve starts near zero and becomes slightly positive and the becomes very negative at midstance. The hip power curve for walking then returns to near zero at end of the stance phase. The hip moment running to power curve is X curve change from negative to positive which indicates an eccentric motion. The hip power curve for running exhibits a similar pattern to walking but with higher values for both positive and negative peaks.