RESULTS AND DISCUSSION

Time–space parameters: wide stride of the amputee is greater than the normal one in order to find balance (it depends on stump length); length stride lower than the normal ones since knee and hip have a limited flexion and there’s absence of plantarflexion in the ankle joint. Stance phase and contact time lower than normal athletes (search for adjustments due to the prosthesis comparing to the sound foot) Cadence and sprinting velocity of the amputees are lower than the normal athletes of pro and junior level, but greater than amateur ones.

KINEMATIC PARAMETERS OF BELOW AMPUTEES

The range of motion of the pelvic tilt is proportional to the athlete energetic cost; as a matter of fact the sprinter maintains the body forwarded and in the case of normal athletes it assumes lower values. Obliquity it goes down on prosthesis side in loading phase (spring phase). Extratraction during stance phase and low intrarotation during swing phase.

Hip prosthetic side: extension close to zero, lower than the normal athletes (60°) in relation to toe-off and a smaller value of the peak flexion during swing phase (about 10-20°) less than normal ones. On the frontal plane, during the contact phase, the hip of the amputee limb, in opposition to the sound limb, gets in abduction in order to compensate knee intrarotation. On the horizontal plane it goes on extratraction during swing phase.

Knee: the knee of the amputee limb gets a limited flexion due to socket ties and a limited extension for the alignment between socket and foot which maintains a flexion of about 10-20°. On the frontal plane it shows abduction during stance phase. On the horizontal plane it shows a constant intra-rotation due to the length and morphology of the stump (blue line presents shorter stump).

Ankle: prosthesis ankle angle lower dorsiflexion due to the shape and to the elasticity of the mechanical foot, close to the horizontal during swing phase due to the maintenance of the angle shaped by the foot profile.

KINEMATIC PARAMETERS OF ABOVE AMPUTEES

The force unloaded to the ground depends on some parameters: Athlete muscle strength, physical attitude, type of prosthesis foot, class of prosthesis foot (stiffness).

Analysis of the same athlete: 1 sound limb (3234 N), 0.7 Springlite foot(2254 N), 0.6 Cheetah foot (1960 N)