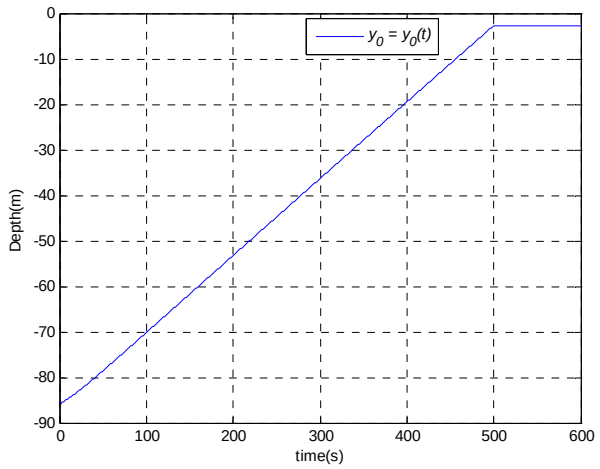

Figure 5. Time histories of the drag body depth

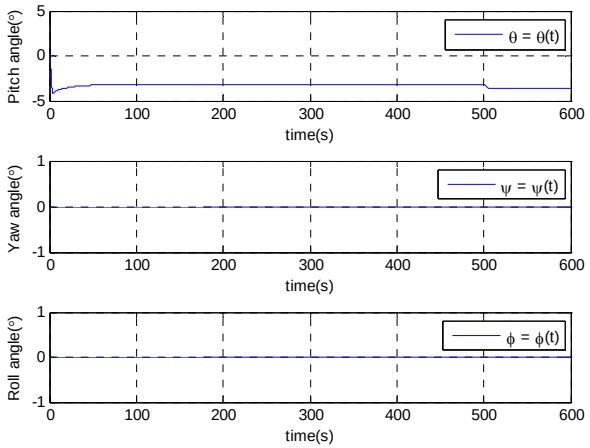

Figure 6. Time histories of the drag body posture angle

It can be seen that the motion of the navigation body,the cable and the drag body are coupling during the recycling; at the beginning of the recycling, due to the effect of the cable and the control the navigation body sinks slightly and the pitch angle of the navigation body increases until the cable is entirely recycled; the pulling force on the navigation body by the cable increases rapidly at the start and then decreases evenly in course of recycling; the drag body roses gradually and the pitch angle of the drag body keeps in a steady value.

IV. CONCLUSIONS

A three-dimensions dynamic model of a typical underwater towed system is studied, and also the numerical simulation of the cable recycling is given which the towed system navigates at the fixed depth of 2.5 metres underwater by 6kn straightly. Via the figures shown above, it comes to the conclusions:

First, the motion of the navigation body , the cable and the drag body are coupling during the recycling;

Second, due to the pulling force by the cable, the navigation body sinks slightly, in order to navigate at the fixed depth, the control makes its' pitch angle increaseing, the system will get to steady until the cable is totally recycled;

Third, at the beginning of the recycling, the pulling force on the navigation body by the cable grows rapidly because of the start of recycling , after geting to the maximum value when the relative velocity get steady to 0.4m/s, the force decreases gradually for the fluid resistance on the cable decreases greatly, the force will keep in a stable value when the cable is totally recycled;

At last, the depth of the drag body roses gradually and the pitch angle of the drag body keep in a stable value during the recycling, the depth and the pitch angle of the drag body will keep steady after the cable is completely recycled.

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