



NON STOP FAST LOCK

The 1st China-ASEAN Science Popularization Contest

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The research background



**Linhuaigang water
control project**

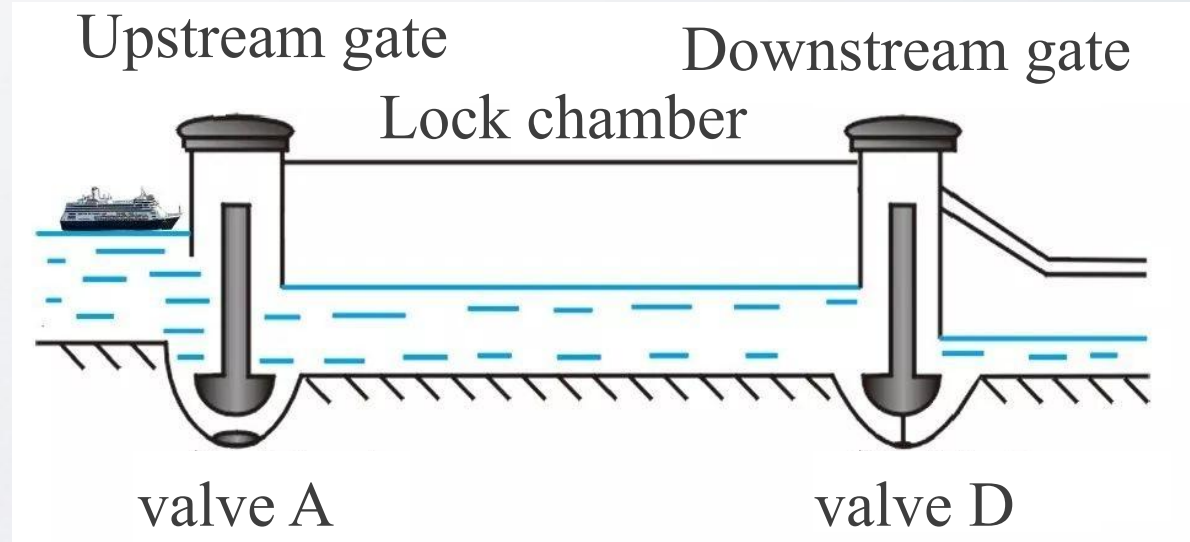


Lock location map





The research background



Multiple procedures are required for one-time gate crossing, and the gate crossing time is long.





The research background



**Serious lock
congestion!**





Design ideas

The revolving door structure is adopted to simplify the ship crossing procedure

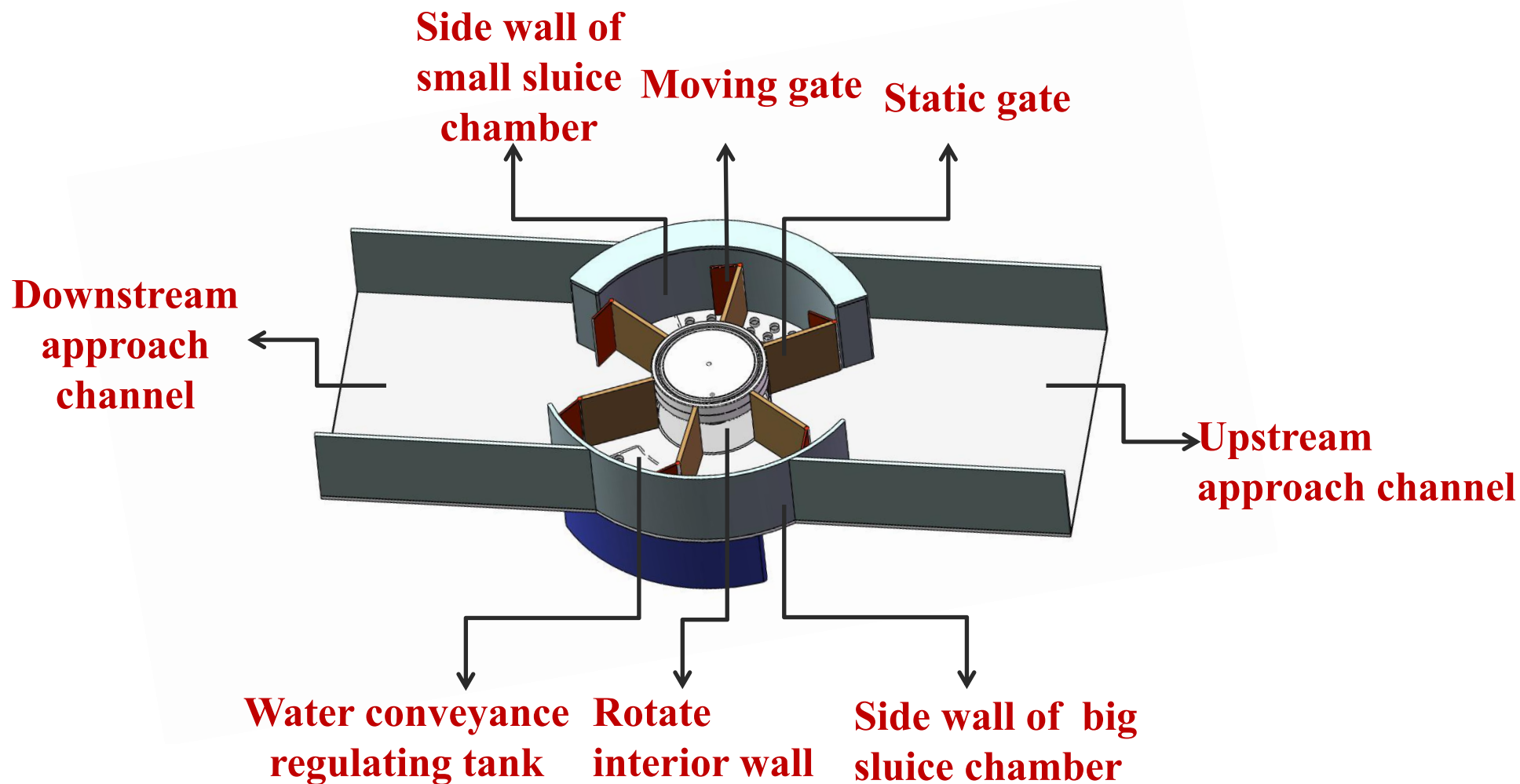


Non stop fast lock



The structure design

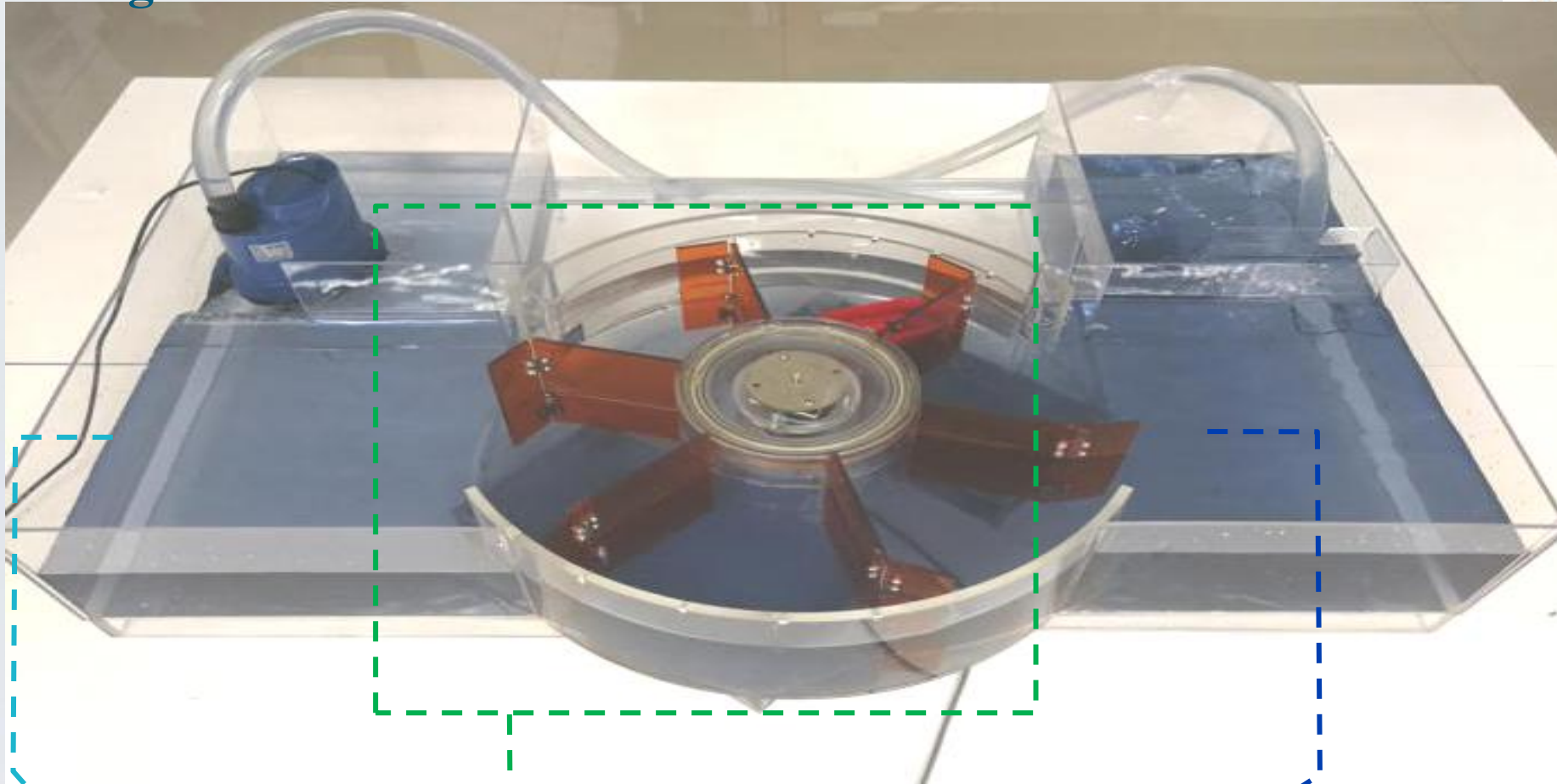
Overall structure





The structure design

Model diagram



Downstream approach channel

Main structure

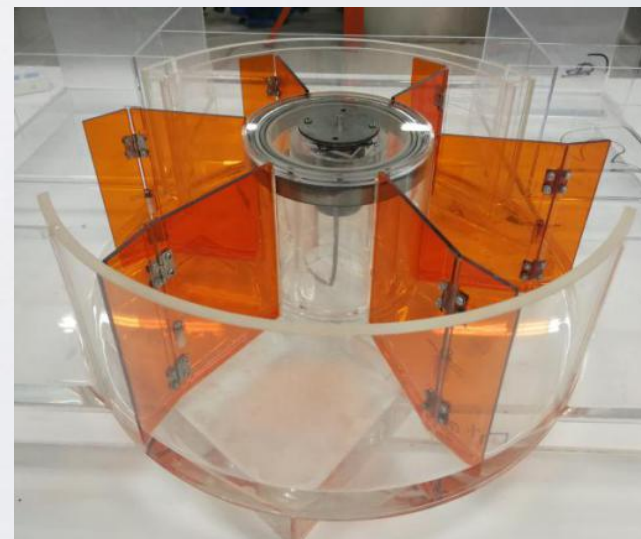
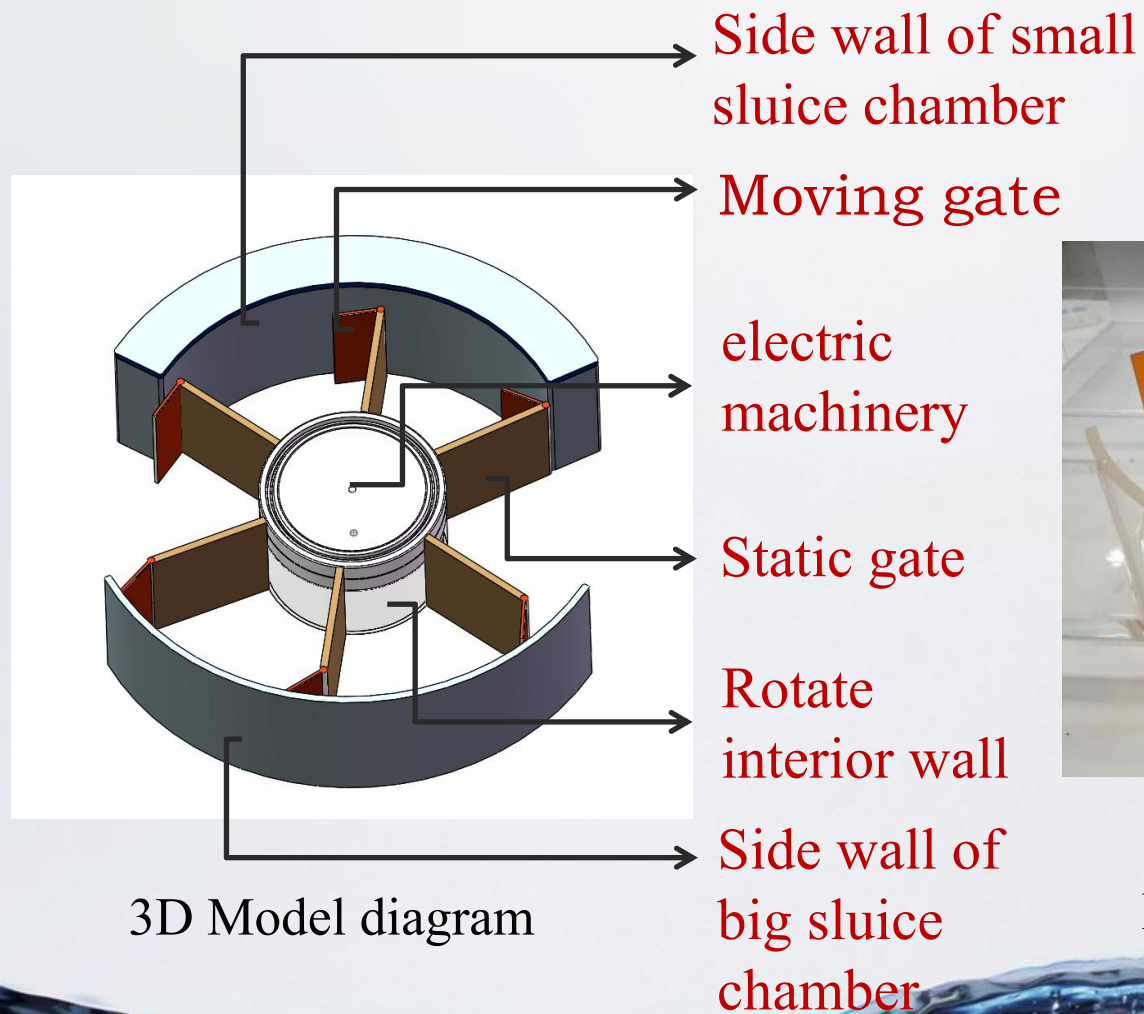
Upstream approach channel





The structure design

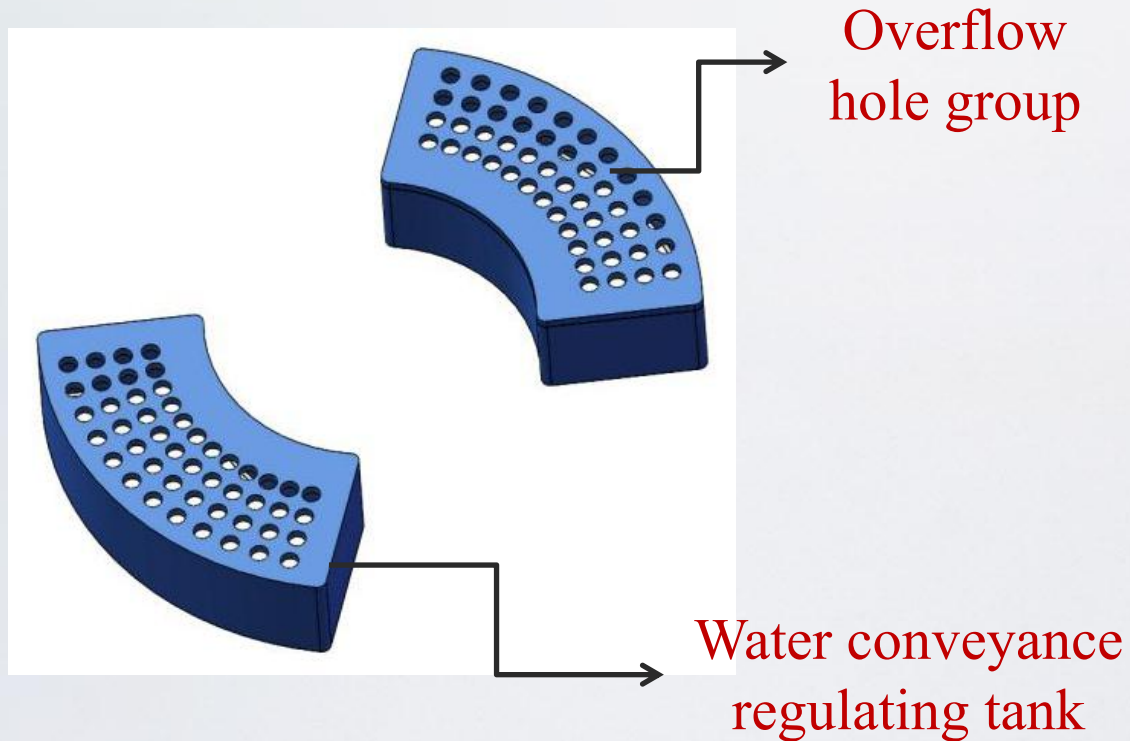
Lock chamber



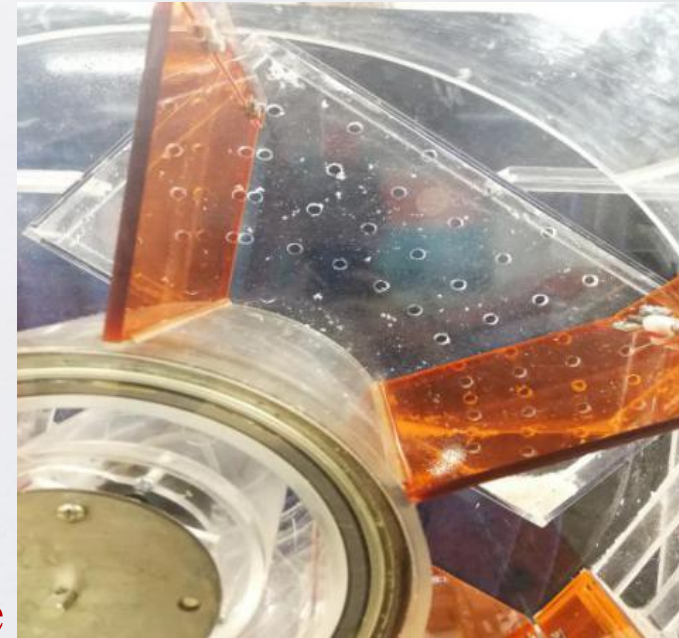


The structure design

Water conveyance system



3D Model diagram

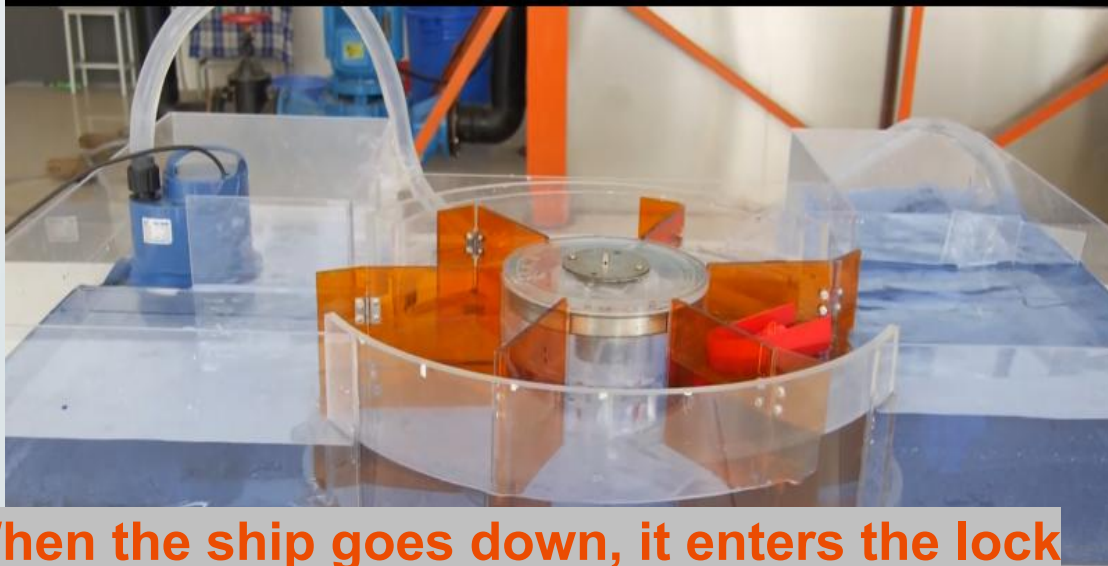


Physical model drawing

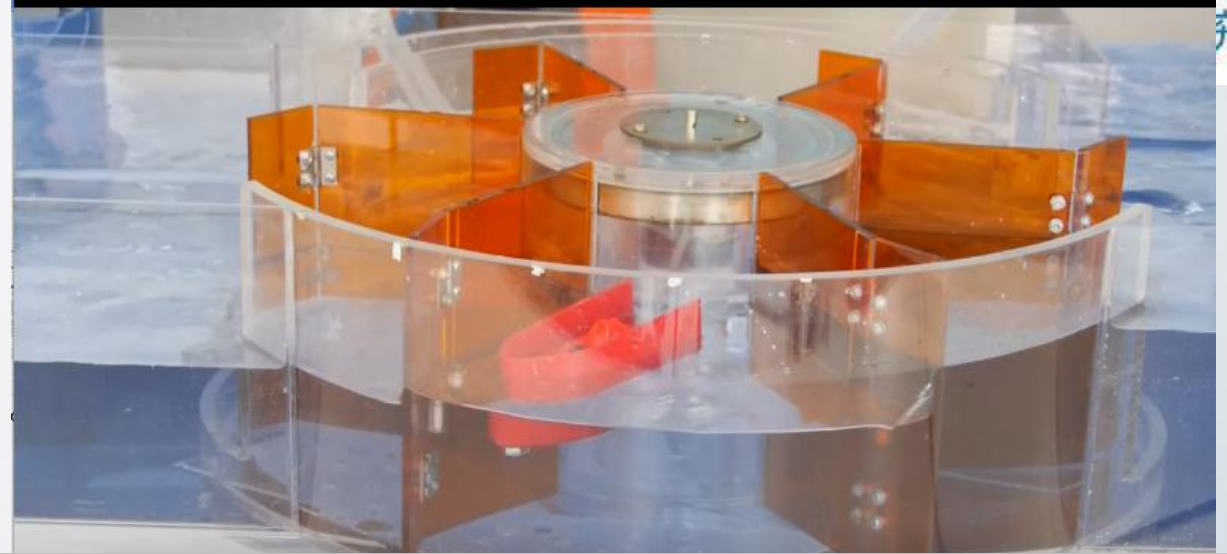




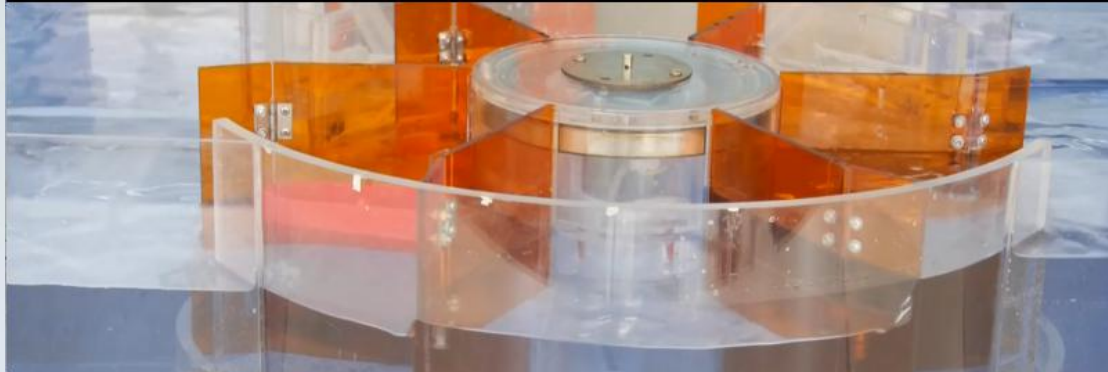
working principle



When the ship goes down, it enters the lock chamber from the upstream approach channel.



When the gate behind the ship moves to the side wall of the lock chamber, the water body in the section where the ship is located begins to be connected with the downstream water body through the water conveyance system.



The water level in this section continuously drops until it is flush with the downstream water level. Finally, the ship sails out of the lock chamber and enters the downstream approach channel





1

Short passing time

The rotary gate structure is adopted to reduce the ship passing procedures

The form of **overflow hole group + water transfer regulating tank** can realize the automatic rise and fall of water level

2

energy conservation

The movable gate and the static gate are combined to achieve the purpose of using the water level difference between the upstream and downstream to assist in driving the gate rotation.





Innovation and Prospect

1

The lock has the advantages of short passing time, high navigation efficiency and convenient operation and management. It belongs to a medium and low head ship lock.

2

It is in line with the development direction of "smart ship lock" and makes ship navigation safer and faster





Thank you

Comments and corrections are welcome

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