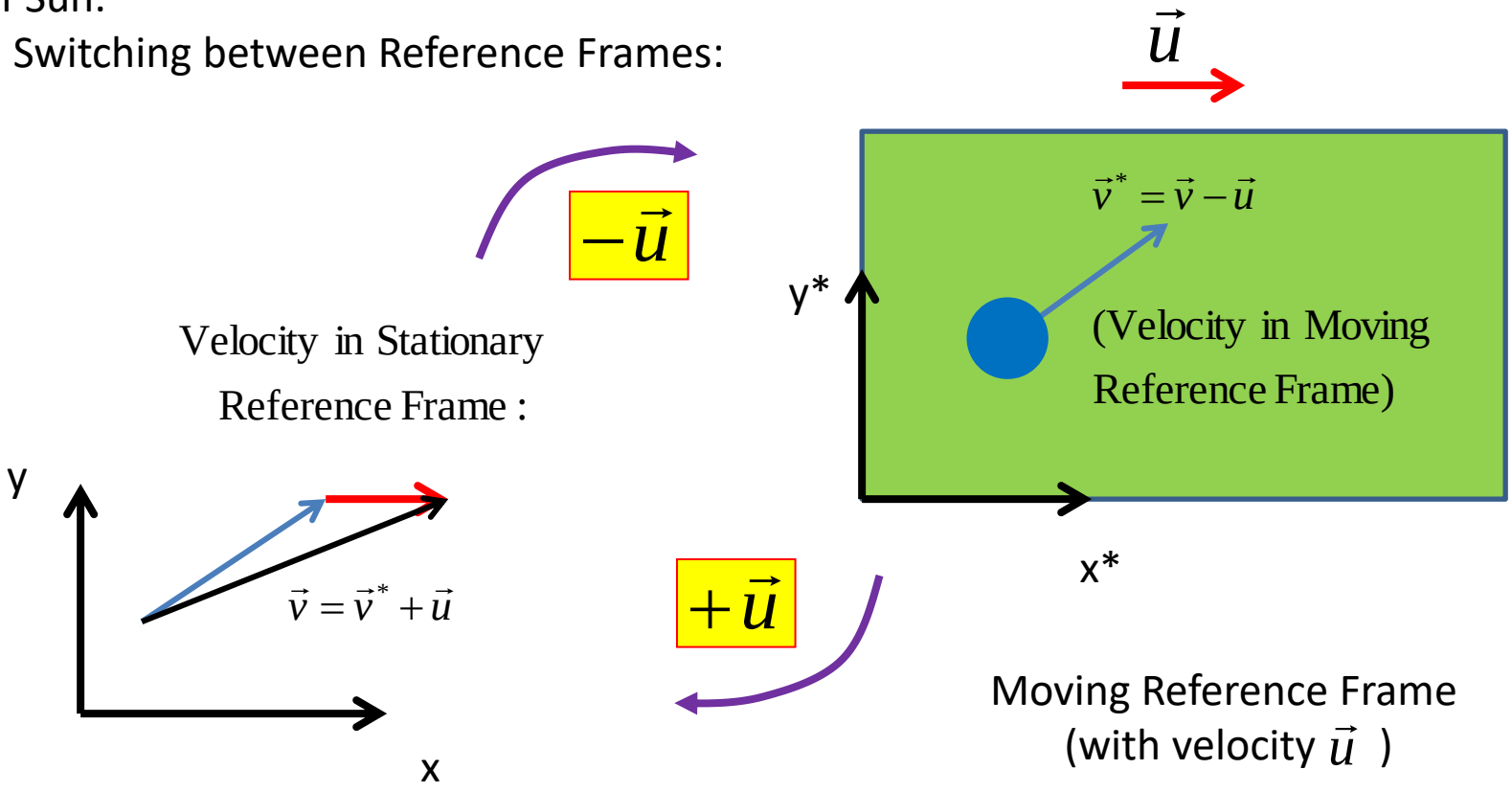
Reference Frame

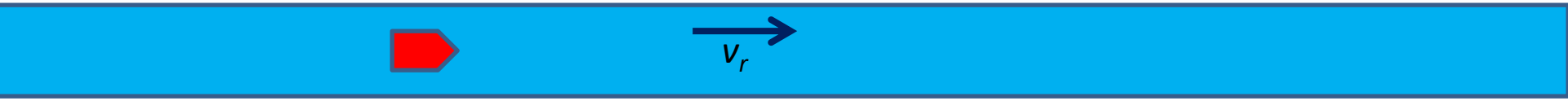
- In order to describe a motion , we need to specify the **Reference Frame**, i.e. Coordinate System at each moment of time.
- **Examples:** Reference Frame of a moving train, of water in river, of a person on a bench, of Sun.
- Switching between Reference Frames:



Homework

Problem 1

River flows with speed ***v_r=2m/s***. A fisherman uses his boat to get to a village situated at distance ***d=2 km*** down the river, and returns back to his home. During the whole trip, the speed of the boat is **V=3m/s** *with respect to the water*. Find the total time of the two-way trip. Does river flow make it longer or shorter?



Problem 2

Fisherman crosses a wide river on a boat. The velocity of the boat with respect to the water has magnitude V and is directed exactly perpendicular to the flow. What is the speed of the boat *with respect to the land,* if the speed of the river is v_r.