For the wagon wheel (or fidget spinner) the rotation is at a certain velocity or frequency. If the frames per second (or frame rate) is low, than even if the rotation is occurring in a clockwise direction, it may see the dot at point “A”, but the next frame capture may not occur till point “B” and after that point “C”, and would therefore mistakenly be interpreted as moving in a counterclockwise direction.

![Diagram](image)

If the frame rate were increased (or the velocity decreased), we would see clockwise rotation:

![Diagram](image)

Hopefully you can see the analogy to Doppler; frame rate = pulse repetition frequency (PRF), and velocity of spinning equals velocity of blood flow.

As you will see from the references described at the end of the document, the PRF/2 is the maximum velocity before aliasing occurs.
In this color Doppler (also PW) tracing taken is in systole, the 2 signals which are MR and LVOT flow should be red as they move towards the transducer, but they are blue. This is because I have decreased the Nyquist limit to a very low 11 cm/sec so that aliasing is easily produced.
Here are 3 tracings of PW Doppler of mitral inflow taken within seconds of each other:
A shows clear aliasing. All the diastolic signal SHOULD be below the baseline moving away from the transducer (white arrow), but some is above (red arrow). In B by increasing the scale, the PRF has been increased, and the aliasing disappears. In C, the baseline has been moved up, a sort of cut and past way of eliminating aliasing.

With continuous wave Doppler, the PRF is infinite so that aliasing should not occur.
This series of articles is an excellent resource for this confusing subject.


2. Vol. 21, No. 8, 2004 ECHOCARDIOGRAPHY page. 759; “Spectral Doppler Instrumentation”


4. Vol. 23, No. 6, 2006 ECHOCARDIOGRAPHY page. 529; “Spectral Doppler Instrumentation”