

Gyroscopic precession in semi-ridged bodies

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Hi. I have a bit of a debate going on with regard to if helicopters experience gyroscopic precession. You see, the idea makes sense at first, and it probably still affects them to some extent, but to what extent is the real question. There are a few things that affect this.

One is that in many helicopters, the rotor blades are not ridgedly attached to the rotor hub; they are free to move up and down a bit, as well as the fact that the blades also flex a bit. But at the same time, the joints have dampeners and other things such as "centrifugal force" (yes, I know it's not a real force) limit the up and down movement. So it acts like a semi-ridged body.

My question is, if, and to what extent, does gyroscopic precession still effect the behaviour of the rotor? From a the perspective of an individual rotor, who's rotation point is just out-side one end, rather than in the middle, how does that gyroscopic precession? And what about from the perspective of the rotor as whole, as a semi-ridged body?

Any input would be much appreciated.

Thanks, Justin.

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