

# VIRGA

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As pilots, we all have spent our fair share of time “down here” looking “up there”. How many of us have seen the phenomena in the picture to the right? This is virga, an area of precipitation which evaporates before reaching the ground. While very pretty, it can be hazardous to general aviation, as I recently discovered on a cross country with one of my Secondary students.



This particular flight was the instrument cross country within Secondary, near the end of the course. The scene was very pretty, as only a pilot could appreciate. Very similar to the picture to the right, the sun was just setting and we were surrounded by areas of wispy clouds, making it appear that we were flying through a school of jellyfish. My student had very little “actual” instrument experience, so I was excited when our IFR route appeared that it was going to take us through one of these clouds. As we entered the base of the cloud, I noticed that our altitude, which my student had been holding very well throughout the flight, was starting to descend. I reminded her to keep her instrument scan going, thinking she had fallen for the error of omitting the altimeter from her scan, but as the moments ticked by, our altitude continued to drop. I then instructed her (a little more directly this time) to climb back up to our assigned altitude, as this was an IFR flight. I could then tell that she was making an attempt to climb, but the airplane just wasn’t responding. As we approached 500 feet below our assigned altitude, I took control of the airplane and attempted to climb myself. Even with full throttle and pitching for  $V_y$ , we continued to descend. At this point, I knew that we needed to do something else quickly. Deviating from our ATC assigned route (reference 14 CFR 91.123), I turned the airplane to the heading I felt would most quickly get us clear of the cloud and radioed to Wichita Approach that we were deviating course, the reason why, and that we were correcting back to our assigned altitude. It took only a few seconds for us to get clear of the virga shaft, and within a minute or two we were back to our assigned altitude and back on course.

I used the opportunity as a teaching moment and we discussed the dangers of microbursts, particularly in the terminal environment while either taking off or on approach to landing. So what caused our sudden loss of altitude when flying through the virga shaft? A fellow flight instructor (thanks Chip!) explained to me later that evening that virga is an area of precipitation which evaporates before reaching the ground. Evaporation, contrary to what you may think, is actually a cooling process. When the water molecules change from liquid form to vapor form, heat is absorbed from the surrounding air, cooling it. Cold air, as we know, is more dense and therefore sinks. The evaporation of the precipitation, therefore, caused a shaft of sinking air directly below the cloud. This is precisely what we flew through.

We happened to be over southern Kansas when this occurred, with miles of flat farmland below us. What if we had been flying through mountainous terrain? Course deviation may or may not have been an option with mountain peaks on either side of us. What’s the lesson to be learned? Just like jellyfish, virga is pretty, but something more safely admired from a distance.