The question I have, has to do with relativity (or so I think).

Imagine a fighter jet with two pilots travelling at twice the speed of sound. I would imagine that if the pilot R (rear seat) throws a tennis ball at Pilot F(front seat), it will hit pilot F as the ball was already travelling at Mach 2 and it was further boosted by pilot R. (please correct me if I am wrong). Will it be the same if pilot R shouts at pilot F.(does sound waves act just like the tennis ball relative to the speed of the jet aircraft?)

Answer:

Yes, you are correct about a tennis ball. A fighter jet, with pilots, tennis ball and air inside, acting like a closed inertial reference frame . Physical laws take the same form in all inertial frames, thus in this problem sound waves will act like a tennis bell and pilots can hear each other.

Other situation will be if there are <u>two jet</u> fighters or some plane <u>without</u> cab (see picture bellow). In this case frame isn't closed and air between the pilots doesn't moving with plane, so in this case they can't hear

each other, because [speed of sound](#) is the property of the material in which it propagate .