

## The Modern Heater

### A analysis of the different strategies behind an MLB fastball

By Adam Harband

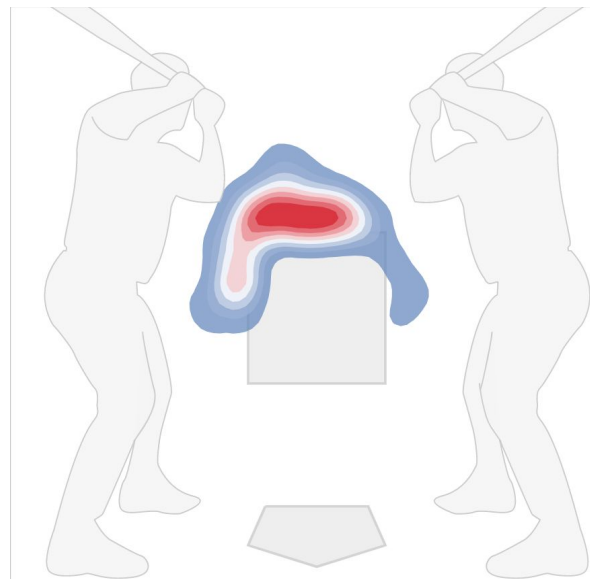
For years, pitchers have been taught to throw their fastballs for strikes, and use their offspeed to finish off the hitter in leverage counts. The analytical era of pitching has shown that fastballs can be used in numerous ways, from cutting and sinking, to rising, the modern fastball can be a pitcher's best pitch. In this piece, I will provide examples of different ways MLB pitchers use fastballs, with an explanation as to why. As the MLB evolves, the fastball evolves alongside it, with every pitcher using it differently to suit their specific strengths. All charts and statistics are courtesy of Baseball Savant, as well as MLB Statcast.

#### **Gerrit Cole**

While the Cy Young runner up boasts incredible velocity on his fastball, averaging 97.1 mph, the most incredible part of Cole's fastball usage is how he gets swings-and-misses on balls at a higher rate than any other starting pitcher in the MLB. As seen in the heat map (left) of

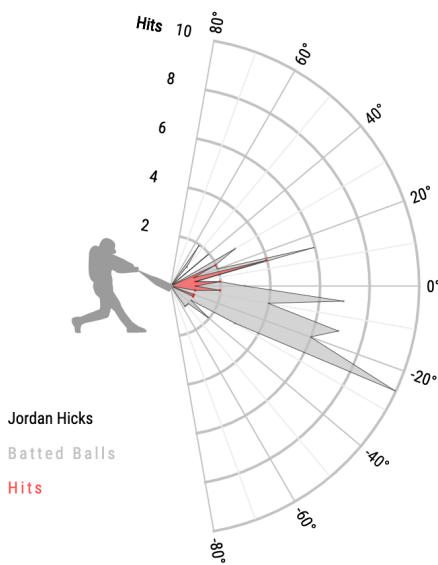
Cole's location of swing-and-miss 4-seam baseballs out of the strike zone, he frequently utilizes the 11 in. of horizontal movement on his fastball (4 in. above league average) and 11 in. of vertical drop (5 in. below league average) to create the effect of a ball rising and coming towards a right-handed batter. What makes Cole's fastball a premiere pitch is his usage of movement and velocity to create a visual challenge for the hitter, making his fastball appear as though it will be elevated and in the center of the zone, but in reality will move towards a right handed batter and not drop as much as expected, so it will not even be a strike by the time it gets to home plate. As mentioned in *The MVP Machine* by Ben

Lindenbergh and Travis Sawchik, the Boston Red Sox went from 20th place in adjusted ballpark ERA to 2nd in the span of 4 seasons with the relocation of 2 strike fastballs from low and away to up and in. Cole has used this to become one of the elite pitchers in the MLB. As seen in the swing-and-miss heat map above, Cole has migrated away from throwing his fastball low in the zone, using it's horizontal movement to run in on right handed hitters to garner swing and misses.



## Jordan Hicks

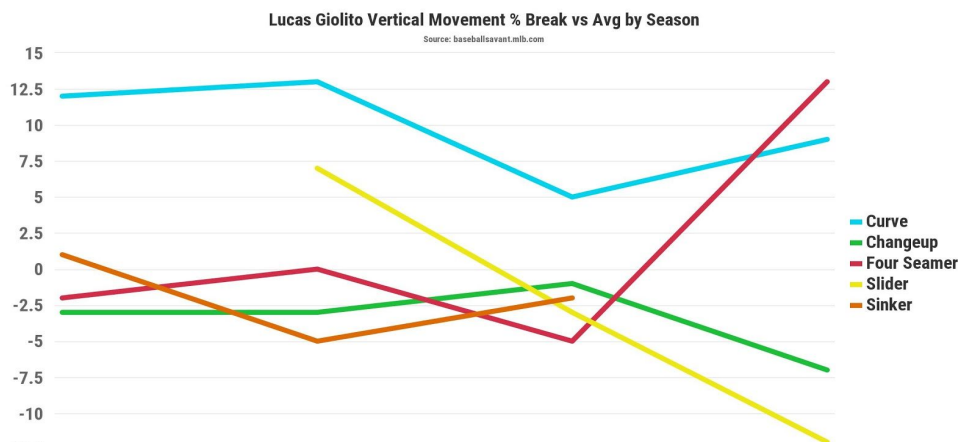
For someone who throws 104 MPH, it would be expected that their arsenal would consist of high heat, but Hicks is an outlier. Despite being second behind only Justin Verlander in Active Spin %, or percentage of spin that contributes to pitch movement, Hicks was in the 8th percentile of fastball spin of qualified MLB pitchers last year. This means that contrary to Cole and Verlander, Hicks' fastball does not have the same rising effect. Instead, Hicks has ditched the 4 seam fastball (only 0.2% usage in 2019) and relies on a sinker to increase his vertical break, while maintaining his velocity. Hicks' uses a 3 pitch mix of sinker, slider, and changeup, which allows him to tunnel all three pitches against one another. Despite throwing his sinker 60 percent of the time, Hicks relies primary on his slider in strikeout situations.



This suggests that Hicks isn't pitching to strike you out, but rather miss barrels and create ground balls (see chart - above). In 73 appearances in 2018, his lone full season, Hicks led the league by giving up 2 barrels on 216 batted balls (0.9%). While most power pitchers rely on throwing up in the zone and tying up right handed hitters, Hicks pitches like a traditional softer throwing sinker/slider pitcher, utilizing horizontal movement to break down the front and back doors of the strike zone. I enjoy watching Hicks pitch because he throws hard enough to pump fastballs by hitters on a consistent basis, yet he has accepted the analytics of his arsenal and uses them to his advantage. Coming off Tommy John surgery later this summer, I look forward to watching Hicks' development as a pitcher.

## Lucas Giolito

One of my favorite stories of 2019 was Giolito, a former top prospect who had been written off and traded before his 25th birthday, rebounded last season and became an unlikely ace for the Chicago White Sox. His 2018 season was abysmal, leading the league in runs allowed by over 20, and ranking in the bottom 10% of the league in K% and BB%, and had a xwOBA to the tune of .350. In 2018, Giolito was using a 5 pitch mix, consisting of 55% 4-seam fastballs

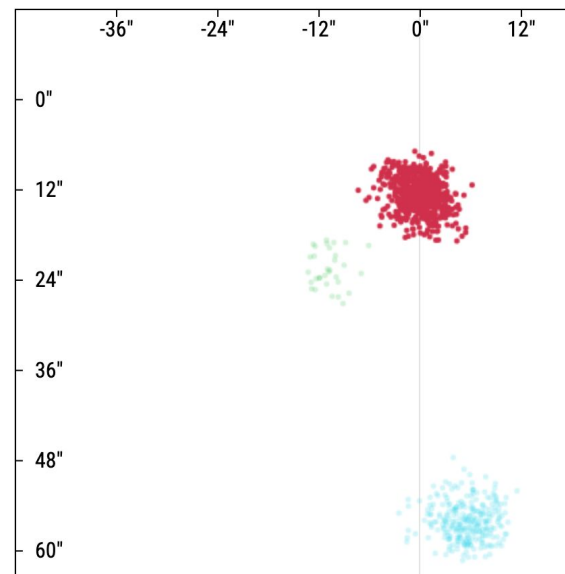


alongside 20% sinkers, which had a vertical movement that was barely better than his fastball, and its

horizontal movement was about the MLB average, it wasn't a special pitch, yet Giolito was throwing it at a very high rate. In the offseason, Giolito made 3 crucial changes, he stopped throwing his sinker, he developed his change-up, and he gained 300RPM and 2.3mph on his fastball, reaching 2300+ RPM and 95mph, putting him in the 66th and 70th percentile of MLB respectively, and most importantly, decreased the vertical movement of his fastball by over 4 inches (see above). This allowed Giolito to pitch off of his fastball and made his changeup even more devastating, increasing it's whiff and putaway percentage by 8%.

### Tyler Glasnow

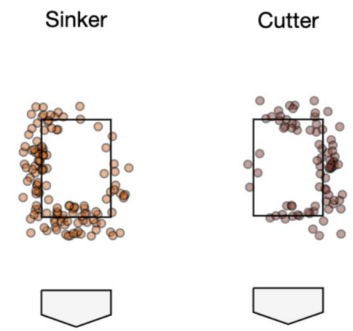
Unlike Giolito and Hicks, Glasnow's fastball has zero horizontal movement and his curveball is below league average in the category, he is the epitome of a North and South pitcher. Excluding a power changeup (averages 93mph) that he throws 3.5% of the time, Glasnow's two feature pitches tunnel each other until his curveball drops out of the strike zone. The 6'8 righty uses his high release point to create the illusion of his fastball dropping below the strike zone, but it often catches the bottom of the zone. After experimenting with a sinker (2017) and slider (2018), the righty realized his linear movement was most effective, and ended those two experiments after one season each. Glasnow is a great example of a young pitcher who has learned to pitch to their strengths, with his fastball low in vertical drop (see right - red), and his curveball in the 95th percentile in the category (see right - blue), Glasnow contrasts the two to create an effective two pitch mix, and throws an occasional changeup to keep hitters off balance. Contrary to using sinkers and sliders to go through the front and back doors of the strike zone, Glasnow goes through the chimney. Glasnow's struggles come from when he misses in the middle of the zone, which he has done in the past, but in 2019 he showed his potential, pitching to a 1.78 ERA in 12 starts before going down with an injury. Glasnow also needs to develop a way to go through the lineup multiple times, as he only averages 5 innings per start over the last two seasons.



### Dustin May

This Dodgers top prospect is oozing with potential and red hair. This hard throwing righty sinks and cuts his fastball with pinpoint accuracy, leaving hitters with broken bats and bruised shins. May uses horizontal movement and elevation to keep hitters off balance, with his pitches starting out over the heart of the plate and breaking to the edges. May throws 43.6% of

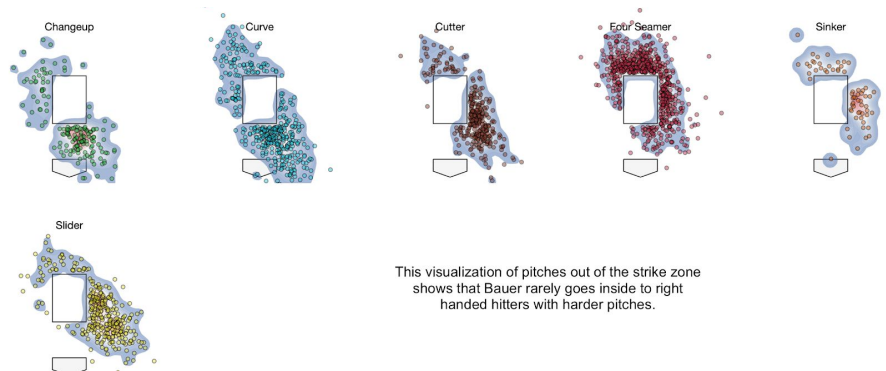
his pitches on the edge of the strike zone, over 10% above the league average. While May utilizes his sinker over 50% of the time, his cutter is his best pitch, boasting a .172 BA against and accounting for over half of his strikeouts. One place May needs to improve is locating his cutter to his arm side, as he struggles to backdoor lefties with it. May has only thrown to that side 4 times (see right), and they were all missing his intended spot. In an August start against the Cardinals, May tried to throw his cutter in to a left-handed hitter and missed, backdooring the pitch perfectly. This accident can be a great tool for May because he can use it in combination with his sinker to create two pitches that look the same on the outside corner to lefties, but break in different directions. May needs to learn to use his cutter and sinker on both sides of the plate, but he has all of the tools to be an elite pitcher.



### Trevor Bauer

The poster child for modern pitch design and development, Bauer describes himself as a “science experiment”, who uses his brain as much as his arm while on the mound. Despite being a pretty average career pitcher, with a career ERA over 4 and a 1.30 WHIP, Bauer showed flashes of his potential in 2018. The MVP Machine references the development of Bauer’s slider, and how he has made it an elite pitch, but his supporting pitches need to develop around his slider in order for it to be most effective. Bauer’s sinker has promise, but is primarily used on the outside part of the plate to right handed hitters. If Bauer was able to throw his sinker on the inside half of the plate, he could use the pitch as a complement to his effective slider. Bauer needs to utilize the inside half of the plate to right handers, because with his launch angle averaging 16° last season (12th highest in MLB) he cannot afford to let hitters get their hands extended. Bauer’s most dangerous weapon is his fastball movement, as his cutter drops 41 inches (league average is 27) due to his high spin rate on his fastball (89th percentile in MLB). Bauer’s 4-seam fastball is also dangerous, creating almost 150% more horizontal movement than the league average, so he must start to use this to his advantage, commanding both in zone 13 (the underutilized zone in the chart below, and then using his slider and cutter to steal strikes on the inside corner. This will also help him against left-handed batters, as he struggles to command the

outside corner, and he tends to leave pitches over the plate trying to jam the inside half of the plate. Bauer shows flashes of greatness, and I look forward to seeing him continue to adapt his repertoire as his career progresses.



This visualization of pitches out of the strike zone shows that Bauer rarely goes inside to right handed hitters with harder pitches.

## **Conclusion**

Analyzing some of my favorite pitchers has taught me a lot about how pitching strategy must be adapted to the player. Often, young pitchers are taught to locate the ball low and to their glove side, but projects like this have furthered my belief that pitching is different for every pitcher, and can even change between appearances based on their pitch feel and mechanical adjustments. Pitchers like Tyler Glasnow exemplify how to utilize a pitcher's strengths, and experimenting from there will only gain understanding of the pitcher's repertoire. I believe a project like this can have applications in youth baseball, as youth pitching coaches often teach the same locational strategies regardless of the pitcher's stuff. Another area of importance is the catcher understanding the strengths and weaknesses of both the pitcher and the batter, and tailoring a gameplan around that information.