Arm Angle Tipping by Pitchers in 2024

Project by Brandon Olivarez

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- Project Goal
  - Find pitchers who have different arm angles on differing pitches, that could be seen as “pitch tipping” during the 2024 season.

- Project Purpose
  - For hitters: To recognize the incoming pitch before the ball is released. The extra tenth of a second can be used to jump on pitches for a better batted result.

  - For pitchers: To identify weak points in their pitching delivery. Also can be used to identify pitches that might have good movement but not great results against batters due to the lack of pitch tunneling.

- Data Used
  - I used pybaseball to extract every pitch from the 2024 MLB season and computed each pitcher's average arm angle by pitch type. To ensure clean data, I filtered out extreme outliers and excluded any non-pitcher appearances. Then, for each pitcher, I identified their highest and lowest mean arm-angle values and calculated the difference between them. This spread quantifies how much a pitcher's arm slot varies across pitches, highlighting those most likely to tip their offerings.

- Data Set
  - 20 active players with the highest pitch arm angle difference

Player Name	Player ID	High Arm Angle Pitch	High Arm Angle	High Arm Pitch Count	Low Arm Angle Pitch	Low Arm Angle	Low Arm Pitch Count	Difference in Arm Angles
ERIK MILLER	669062	4-Seam Fastball	44.98	631	Changeup	24.02	430	20.95
TRENT THORNTON	663423	Curveball	43.88	137	Sweeper	24.09	345	19.8
VALENTE BELLOZO	678368	Curveball	49.83	136	Changeup	34.06	152	15.77
VICTOR VODNIK	680767	4-Seam Fastball	46.43	830	Changeup	30.76	221	15.67
GREG WEISSERT	669711	4-Seam Fastball	23.9	220	Sweeper	8.3	299	15.6
YARIEL RODRÍGUEZ	684320	Curveball	48.94	157	Sinker	33.51	162	15.44
CLARKE SCHMIDT	657376	Knuckle Curve	42.76	306	Sweeper	28.32	419	14.44
BRENDON LITTLE	663893	Knuckle Curve	43.69	221	Sinker	29.32	397	14.37
WALKER BUEHLER	621111	Knuckle Curve	51.99	311	Sinker	37.87	239	14.12
NÉSTOR CORTÉS	641482	4-Seam Fastball	52.83	1272	Sweeper	39.3	454	13.53
JOSH WINCKOWSKI	670174	Cutter	56.3	436	Changeup	42.96	156	13.34
TIM HERRIN	682120	Curveball	36.14	369	Sinker	23.29	156	12.85
MITCH SPENCE	687765	Curveball	55.25	299	Slider	42.86	810	12.39
TOMMY KAHNLE	592454	4-Seam Fastball	44.67	156	Changeup	32.39	657	12.27
JP SEARS	676664	4-Seam Fastball	28.67	1032	Sweeper	16.43	710	12.24
MIKE KING	650633	4-Seam Fastball	36.28	719	Changeup	24.41	717	11.87
LUIS GIL	661563	4-Seam Fastball	39.44	1368	Changeup	27.66	714	11.78
MAX FRIED	608331	Curveball	52.14	586	Changeup	41.03	377	11.11
DEVIN WILLIAMS	642207	4-Seam Fastball	28.51	232	Changeup	17.5	197	11

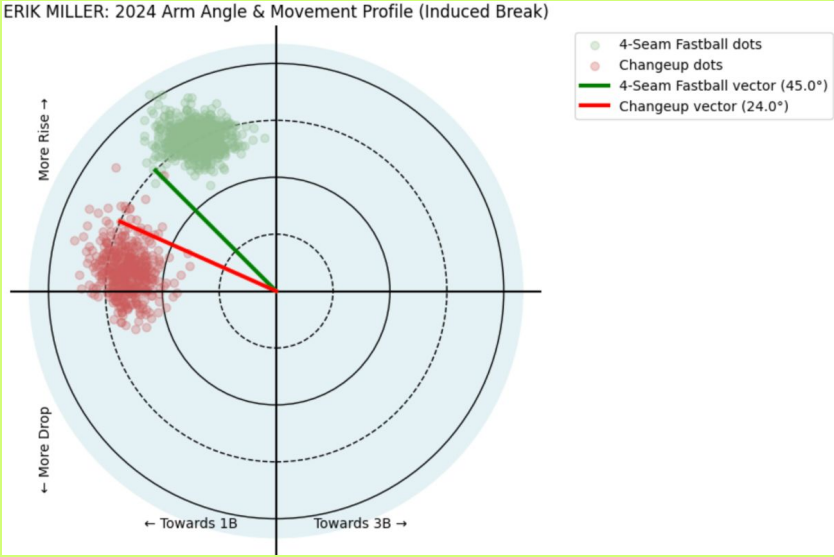
Erik Miller

- High whiff percentage at 85th percentile and great strike out percentage at 92nd percentile for 2024.
- Low chase percentage with a 10th percentile in MLB.

- For pitcher and Player Development department
  - Focus on achieving the same arm angle for both the Fastball (45° arm angle) and the Changeup (24° arm angle).
  - Current difference in arm angle is 21° between the two pitches.
  - Tunneling the pitches will lead to a higher chase percentage and less walks (2nd percentile in walk percentage).

Erik Miller

- For batters
  - Pick up on Miller's arm slot as the arm swings forward.
  - Sit and wait on preferred pitch, knowing Miller will likely provide the walk if your pitch isn't there.
  - The Fastball has a 50% usage and the Changeup 34%.



I have provided a graph made on python visualizing the arm slot as well as the pitch movement.

Erik Miller

- For batters

Low release on Changeup

High release on Fastball

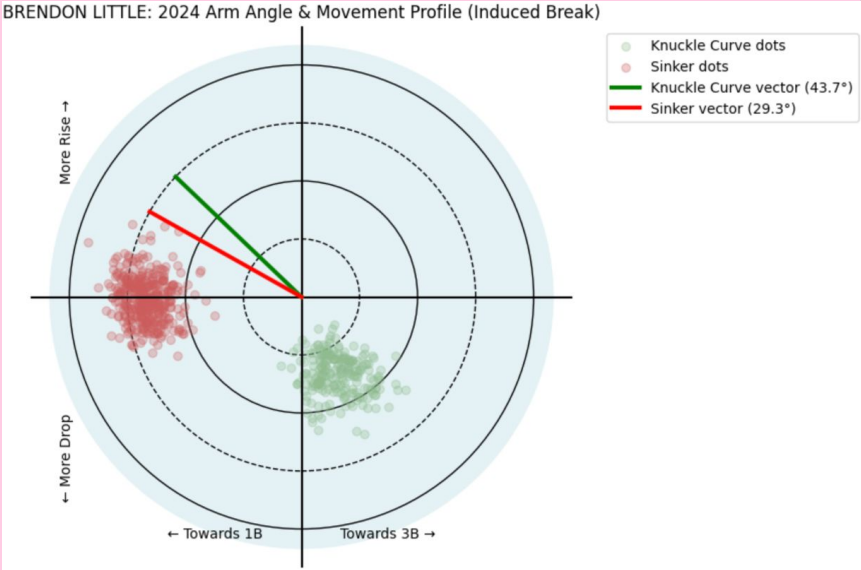
Brendon Little

- Although he did not qualify to be ranked in the 2024 season, he would have been in the 75th percentile for whiffs.
  - But he also would have been in the 30th percentile or worse for chase %, K %, and BB%.

- For pitcher and PD
  - Focus on sound mechanics for both the Sinker (29° arm angle) and Knuckle Curve (44° arm angle).
  - Current difference in arm angle is 15° between the two pitches.
  - Tunneling the pitches will lead to a higher chase percentage, higher strike outs, and less walks.

Brendon Little

- For batters
  - Pick up on Little’s arm slot as the arm swings forward.
  - Little is off to a hot start in 2025, 97th percentile or better in chase, whiff, and K’s. Still walks quite a bit for those percentiles, so just wait on your pitch.
  - The Sinker has a 57% usage and the Knuckle Curve has 32%.



Brendon Little

- For batters

Low release on Sinker

High release on Knuckle Curve

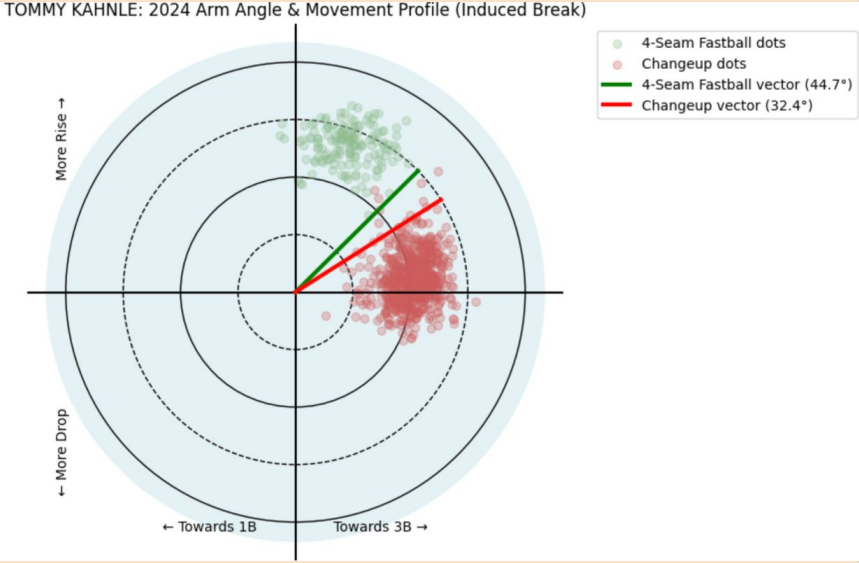
Tommy Kahnle

- Although he did not qualify to be ranked in the 2024 season, he would have been in the 95th percentile for whiffs, and above average in chase and strike out percentage.

- For pitcher and PD
  - Focus on similar arm angle and delivery for both the Fastball (32° arm angle) and Changeup (45° arm angle).
  - Current difference in arm angle is 13° between the two pitches.
  - Since Kahnle is a two pitch pitcher, the delivery for both pitches should be crisp and tunnel well together

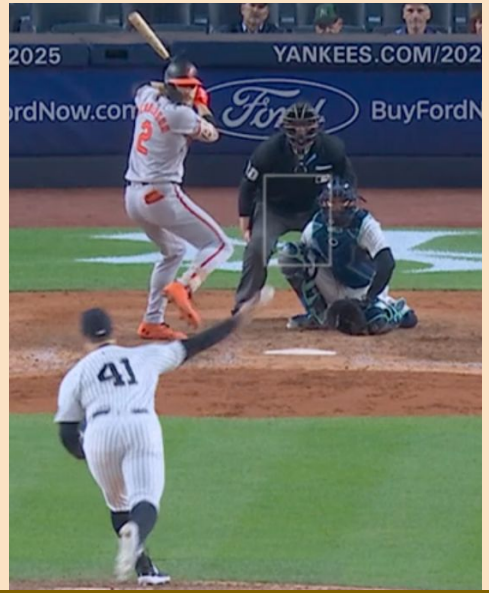
Tommy Kahnle

- For batters
  - Pick up on Kahnle’s arm slot as the arm swings forward.
  - For being a two pitch pitcher, Kahnle has great numbers and experience. He will hit his spots and change your eye level. Do not chase, he has a high walk %.
  - The Changeup has a 57% usage and the Fastball has 32%.



Tommy Kahnle

- For batters



Low release on Changeup

High release on Fastball