The amplitude of the SASI is derived from the radial integral of the full amplitude over the region of shocked gas,

$$C = \int_{r_*}^{r_s} \sqrt{a^2(r) + b^2(r)} dr \quad (3)$$

We extract the values w_r and w_i through least-squares fitting, where w_r corresponds to the angular speed of the SASI, and w_i corresponds to the growth rate of the SASI. To extract w_i, we take the logarithm of the amplitude of the growth curve and use linear regression over the linear segment as shown in Figure 1.To filter out noise, w_r is computed at a small region inside the shock boundary. The parameter w_r is contained in a periodic function given by $tan(w_r) = a/b$, so extracting it requires least-squares linear fitting across multiple periodic segments. We extract linear periodic segments with Pearson correlation coefficients of $r \geq 0.95$ and $r \leq -0.95$ (such that nonlinear segments are excluded) to calculate the angular speed of the SASI, as shown in Figure 2. By joining the extracted segments at π intervals, we can calculate a net wave speed over the segments. Both the scatterplot of the slopes of the periodic segments and the overall wave speed are shown below in Figure 3.

We note that the wave speed of the $m = 1$ modes of the SASI decreases in a convex pattern as the sector angle increases. The growth rate of the SASI, conversely, has a concave pattern that increases to a peak and then decreases. We observe that the angular speed of the SASI in Figure 4 is larger for simulations with an initial angular momentum of 0.05 as opposed the simulations with an initial angular momentum of 0.02, consistent with the findings of Blondin et al. (2017). We find that the angular speed of the SASI where the inner radius is 0.55 is greater than the angular speed of the 0.2 inner radius simulations. This is inconsistent with the findings of Foglizzo et al. (2007). The eigenfrequencies w_r and w_i are plotted using $|v_{sh}|/(r_{sh} - r_*)$ as the relative unit throughout the figures in this paper.

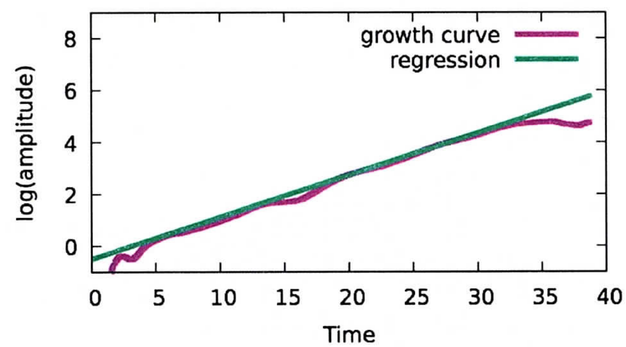

Figure 1. The growth curve for the circular sector $\theta_{sector} = 2\pi$, which we have extracted the growth rate from using least squares regression. The initial specific angular momentum for this specific growth curve is 0.02, and the inner radius of the core is 0.2. A regression of the growth curve for values of the natural logarithm of the amplitude from 0.05 to 3.0 is displayed as well.

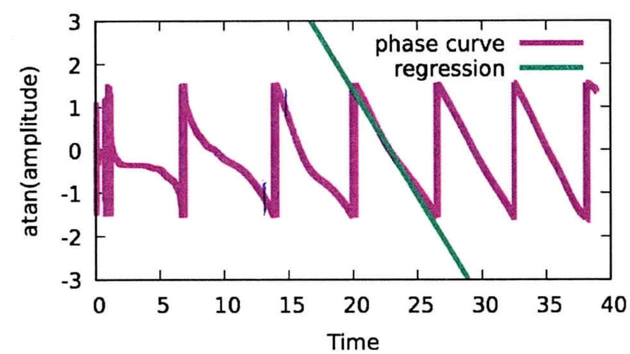

Figure 2. The phase curve for the circular sector $\theta_{sector} = 2\pi$, which we have extracted the angular speed from using least squares regression of the linear segments. The initial specific angular momentum is 0.02, and the inner radius of the core is 0.2. A regression of the linear segments of the arctangent of the phase curve is displayed as well.