**\section{Velocity power spectra}**

To investigate possible effects of sink creation density on the resulting velocity field, we calculate the velocity power spectrum at the same time for each of the runs, at a time just after all of the runs have finished forming their first sink. The AREPO unstructured mesh of the inner $\sim$ 270AU region was projected onto a uniform $1000^3$ grid cube. Taking the Fourier transform of the velocity fields $A\_v$ gives a 3-dimensional $k$ space of velocity amplitudes, where $k$ is the number of wavelengths per box length. The average energy in each $k$ mode $\hat A\_v$ was found by averaging the amplitudes within $k$ shells, spanning out from $k$=1 to $k$=500 i.e the Nyquist frequency of the data. These $k$ modes correspond to physical scales of 270 to 0.5AU, the latter being roughly $\lambda\_J$ of the highest resolution run. The power spectrum $P\_v$ was obtained using

\begin{equation}

P\_v \delta k = \int\_{1}^{500} \hat A\_v^2 4\pi k^2 \delta k

\end{equation}

The radial velocity profile was removed before taking the Fourier transform, by taking the cross product $v\_\theta=(v \times r)/|r|$, subtracting the effects of material falling into the sink, leaving the pure turbulent field. The resulting velocity power spectra are given in figure \ref{fig:spectrum}.

% Example figure

\begin{figure}

% To include a figure from a file named example.\*

% Allowable file formats are eps or ps if compiling using latex

% or pdf, png, jpg if compiling using pdflatex

\hbox{\hspace{-0.5cm} **\includegraphics**[scale=0.5]{velocity\_spectrum.pdf}}

\caption{The velocity power spectrum at $\sim$ 2.5yrs after the formation of the first sink. The velocity spectrum is independent of the chocie of N$\_{\text{sink}}$.}

**\label{fig:spectrum}**

\end{figure}