



The astrometric shift of microlensing events, as seen by a barycentric (dashed line) and a terrestrial observer (solid line). Also shown for comparison is the trajectory of the source without (dotted line) the event. The insets show the deviations with source parallax and proper motion removed. (The lens (mass $0.5 M_{\odot}$) is at 150 pc (left), 1 kpc (centre) and 5 kpc (right), the source at 6 kpc, the transverse velocity is 60 km s^{-1} and the impact parameter u_0 is 1.5.) The points are simulated data points using the Gaia scanning law. Image courtesy of Vasily Belokurov.

The Science Alerts Working Group is focussed on the real-time detection of variable sources. These include supernovae, microlensing events, exploding and eruptive stars.

For example, it is estimated that Gaia will see about 100 000 supernovae and about 20 000 microlensing events. These will be dwarfed by the much more numerous variable stars, estimated at 18 million. Many of the stars will be interesting enough to require prompt identification, for example, if they are undergoing short-lived but key stages of stellar evolution like the helium core flash.

The Science Alerts Working Group is developing software for all aspects of transient astronomy in the Gaia dataset. Using simulated databases seeded with the transient events, we are determining which fraction of the transient sources can be detected in real time. Evidently, it will be important to pick out events as soon as possible to alert observers so that intensive ground-based monitoring can begin. The second stage in developing the algorithms is to establish how the alerts can be most effectively transmitted to the wider astronomical community for follow-up work.

Finally, the Science Alerts Working Group is liaising with the robotic telescope community to find ways in which the Gaia database may be supplemented with additional data, and to develop strategies for a linked set of follow-up robotic telescopes.

Further details about this working group can be found at: <http://www.ast.cam.ac.uk/~vasily/sawg/index.php>