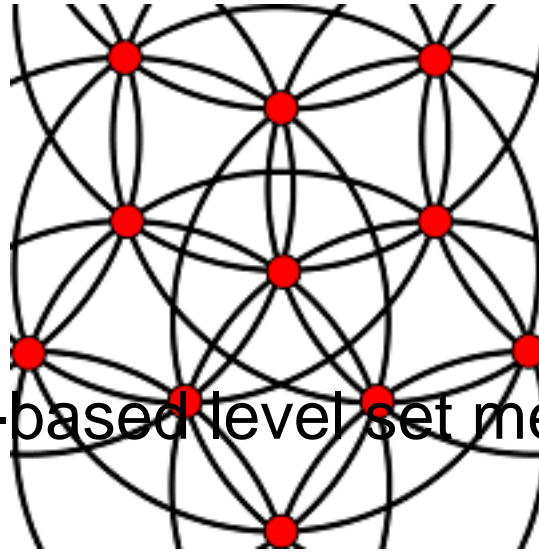


# CSASC 2013



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## Flux-based level set method

### Content :

Level set methods are popular algorithms in applied mathematics to treat dynamic interfaces. There are many variants of such numerical methods, and the flux-based level set method [3] has some distinct features among them.

The method is based on finite volume discretization rather than more usual finite difference approximation. In such a way the method is defined with no additional difficulties for general computational grids. In the case of passive transport with incompressible flow (i.e. the divergence free velocity) the method takes into the account the local conservation of the fluid on finite volumes.

The high-resolution flux-based level set method is second order accurate in space and time for smooth parts of the solution and compares very well with other second order accurate methods [4]. It has been used successfully in some engineering and biomedical applications [1,2].

Recent development of the method is concentrated on semi-implicit time discretization methods [5] that treats the inflow and outflow fluxes differently. Such methods, at least if first order accurate, are unconditionally stable with respect to the choice of time steps.

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