# Simulation of snow transport with the lattice Boltzmann method

The lattice Boltzmann method emerged from statistical physics and was proven to be a valuable tool for the simulation of the dynamics of gasses. Although the derivation of the method is mathematically involved, its implementation can be less demanding and simulations more efficient than the implementation of classical Navier-Stokes solvers [1].

The idea of this software lab is to incorporate particle physics within the lattice Boltzmann method to simulate the transport, deposition and erosion of particles, i.e. snow. In this software lab we will closely follow the work by Alexandre Masselot [2]. We will guide you along the way as you develop your own 2D lattice Boltzmann snow transport simulation code in C++.
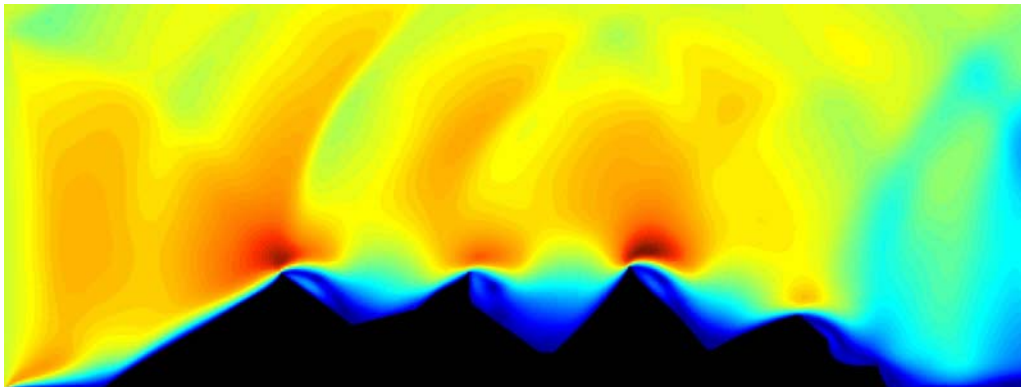
2D flow field of a mountain chain

Within this software lab you will:

1. study the lattice Boltzmann method by reviewing literature and a Matlab script,
2. add particle physics to the Matlab sheet provided,
3. implement the methods from scratch in your own C++ code.

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References

[1] http://www.lbmethod.org
[2] "The Lattice Boltzmann Method: a new approach to snow transport and deposition by wind: a parallel lattice gas model", PhD thesis, http://cui.unige.ch/~chopard/Snow/phd-alex.pdf