Biogeochemical response to spring ice cap melting in lake Pavin

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In order to understand how winter turbulent mixing shutdown influences biogeochemical cycles in deep Pavin crater lake, an autonomous sediment trap and autonomous sensors (data loggers: CTD, turbidity, dissoulved oxygen) were moored from November 2014 to May 2015 in lake Pavin water column. Lake Pavin is a French crater lake known for its meromicticity and accumulation of dissolved trace element in the deep anoxic iron rich layer.

Ice cap footprint on water column turbulence is clearly visible on (1) conductivity and temperature records in the chemocline vicinity, (2) dissolved oxygen signal close to the oxycline. Physical processes that controls the oxycline and chemocline depths are identified and allow to discuss the behavior differences of trace lement concentrations profiles (Li, Y, La, Ce, Co, Ni, As, V, Cr, U, Mo, Cu, Zn, Al, Sb, Au, Se, Ba) collected just after ice cap melting. These interpretations are also enlightened by settling particules compositions and fluxes measured from sediment trap samples collected weekly along the deployment period.