Geophysical Research Abstracts
Vol. 16, EGU2014-4383, 2014
EGU General Assembly 2014

Emission factors from biomass burning in three types of appliances: fireplace, woodstove and pellet stove

Márcio Duarte (1), Estela Vicente (1), Ana Calvo (2), Teresa Nunes (1), Luis Tarelho (1), and Célia Alves (1)

(1) University of Aveiro, Centre for Environmental and Marine Studies, Department of Environment, Portugal (marcioaduarte@ua.pt), (2) Department of Physics, IMARENAB University of León, 24071 León, Spain

In the last years, the importance of biomass fuels has increased mainly for two reasons. One of them is the effort to control the emissions of greenhouse gases, and on the other hand, the increasing costs associated with fossil fuels. Besides that, biomass burning is now recognised as one of the major sources contributing to high concentrations of particulate matter, especially during winter time.

Southern European countries have a lack of information regarding emission profiles from biomass burning. Because of that, in most source apportionment studies, the information used comes from northern and alpine countries, whose combustion appliances, fuels and habits are different from those in Mediterranean countries.

Due to this lack of information, series of tests using different types of equipment, as well as fuels, were carried out in order to obtain emission profiles and emission factors that correspond to the reality in southern European countries.

Tests involved three types of biomass appliances used in Portugal, a fireplace, a woodstove and a modern pellet stove. Emission factors (mg.kg-1 fuel, dry basis) for CO, THC and PM10 were obtained.

CO emission factors ranged from 38, for pine on the woodstove, to 84 for eucalyptus in the fireplace. THC emissions were between 4 and 24, for pine in the woodstove and eucalyptus in the fireplace, respectively. PM10 emission factors were in the range from 3.99, for pine in the woodstove, to 17.3 for eucalyptus in the fireplace.

On average, the emission factors obtained for the fireplace are 1.5 (CO) to 4 (THC) times higher than those of the woodstove. The fireplace has emission factors for CO, THC and PM10 10, 35 and 32 times, respectively, higher than the pellet stove.