Variations in wood components in TMP mill white water and their effect on paper properties

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Abstract: Correlations between the amount and composition of extractives in the white water of a thermomechanical pulp (TMP) mill in southern Norway were observed over a period of one year. Clear process water samples from the disk filter were extracted with methyl tert-butyl ether (MTBE) and the extractives determined by gas chromatography. Laboratory sheets were prepared from Norway spruce (Picea abies) groundwood pulp using clear filtrate as white water. Further sheets were prepared using the same groundwood pulp to which a colloidal dispersion of extracts from spruce TMP were added. The tensile index and optical properties of the sheets were measured. Although the total amount of extraction in the clear filtrate varied during the year, no evident seasonal variations were found. An apparent correlation was found between extractives composition and sheet tensile index. However, laboratory research using synthetic white water with a varying ratio of bound fatty acids to free fatty acids did not reveal any effect of extractives composition on the tensile strength of mechanical pulp. Therefore, it was not possible to establish the reason for seasonal variations in TMP pulp properties. New laboratory experiments will be conducted to investigate whether the tensile strength had already reached the lowest value so the composition of wood extractives might not affect the pulp strength further.